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STEEL

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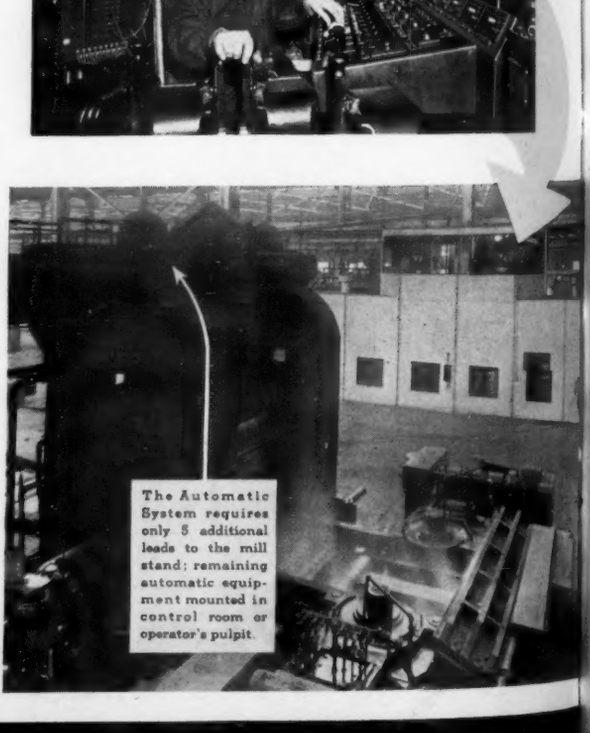

The Automatic System requires only 5 additional leads to the mill stand; remaining automatic equipment mounted in control room or operator's pulpit.

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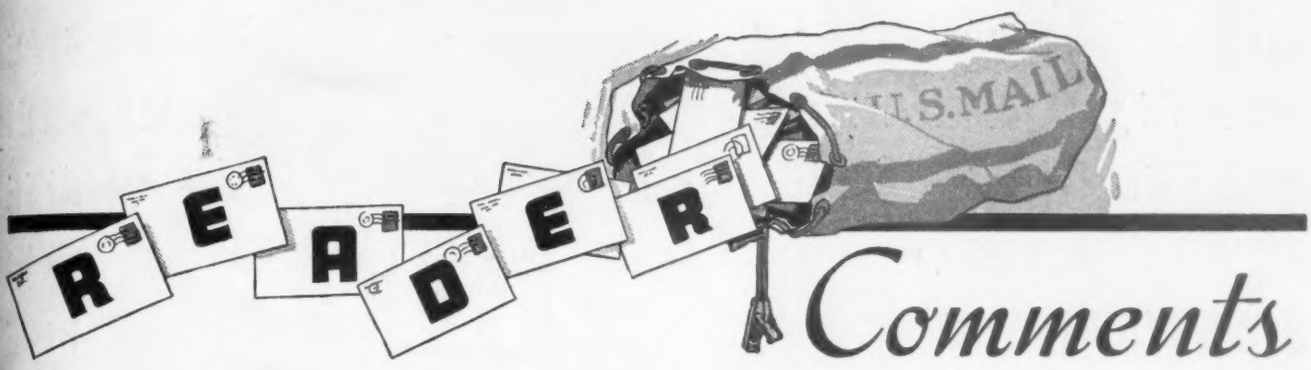

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Afraid of the Government

To the Editor:

Being a payer of income taxes in substantial amounts and an employer of labor I would no doubt be classed by the President as an economic royalist.

For many years I have owned a home which is recorded in my wife's name and paid taxes on it which I deducted from income on my return.

For 1936 I found that my wife had a taxable income and so we made out separate returns.

In that year I had enough income to pay the current real estate taxes and also three years of back taxes, amounting to about $2100. Since I paid the money I deducted it from my income.

Upon examination the agent advised that since the home was in my wife's name I could not take the deduction and since I had paid the money my wife could not deduct it from her income.

The result is I am assessed and have to pay a considerable additional income tax. It seems like plain robbery to me.

Now, suppose I had sold John Smith $2000 worth of goods and as an accommodation his brother, Sam, paid the bill, but I continued to hound John for the amount claiming that he, John, bought the goods and must pay.

Can you imagine an economic royalist trying to commit such a crime against justice and honorable dealing.

In the past, it was probably such unjust and oppressive acts on the part of foreign governments which generated anarchy and hate of all government and a desire to emigrate to the United States.

Is our government generating such feelings in its citizens?

I have not signed my name because I am beginning to be AFRAID of our government.

A Cleveland Citizen

Story Pleased Everybody

To the Editor:

The splendid treatment given the story of the new J. & L. strip and sheet mill in the Dec. 20 issue of STEEL is greatly appreciated.

We have received much favorable comment on your article, not only from our own people but from within the trade as well.

W. T. MOSSMAN

Jones & Laughlin Steel Corp., Pittsburgh

Steel Has Many Aids

To the Editor:

The recent bulletin by the American Iron and Steel institute stating that 57 of the 92 chemical elements are used in steel mills, directly or indirectly in the production of steel, is of great interest. It emphasizes the valuable results of modern research in the effort to make steels of widely varying characteristics to meet demands for greatly dissimilar purposes.

The term "tailormade steel" is well applied to the modern product and as time goes on it will be more and more closely "tailored" to fit expanding uses.

That more than half the known elements enter into the manufacture of steel indicates the breadth of research aimed at making the best possible product. The wonders wrought in the past five or ten years show results of new applications of available materials in new combinations.

Pure research has yet many secrets for investigation and perhaps even more of the elements will be requisitioned, to add to steel's adaptability.

RESEARCH

Chicago

Threat to Coal Industry

To the Editor:

This has no political significance. It is simply a statement of our views based on nature's first law, self-preservation.

Your assistance is solicited in the matter of defeating two legislative proposals to be considered by the congress, "The Seven Sisters" of the TVA bill, and the 70-car train limit bill. Each of these would add to the cost of coal. The less coal we mine the more it costs per ton. The more trains the railroads operate the greater their operating expenses.

If you are in accord with us that the coal industry, one of the major employers of labor both directly and indirectly by their kinship with the carriers and the other industries and supply companies, should not be throttled by subsidized competition, please use your influence with your senators and congressmen to defeat the above indicated bills.

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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PRODUCTION · PROCESSING · DISTRIBUTION · USE

4000 LB. PAY LOADS . . . LONG SERVICE LIFE

Monel crate fabricated by Bos-Hatten, Inc., for J. H. Williams & Co., both of Buffalo, N. Y. Designed to carry 2 tons of miscellaneous forgings. Weight of crate 1,300 lbs. Two of these crates in service 18 months look as good as the day they were installed.

Both are delivered by crates like this one—it's corrosion-resistant Monel

Pile a couple of tons of parts into a 1,300 lb. crate. Lower the load into an 8% sulphuric acid, 185° F. solution. Repeat this dose many times daily for 18 months—then take a look at the crate. Take a look at the crate pictured above, in fact: For it's been subjected to just that kind of treatment for just that length of time.

Not a single sign of corrosion or weakening can the user see in *this* crate. Made of Monel,* it looks and is as good as new. For Monel, as you know, stoutly resists the corrosive effects of pickling acids. As strong and tough as structural steel, the original high strength of Monel is lasting.

In building Monel crates you don't need to provide a lot of excess weight to compensate for weakening due to corrosion. Furthermore, Monel is easy to fabricate—by all the standard processes, including welding.

Next time you add a new crate, or replace an old one, build it of Monel. Get some practical suggestions by reading "Equipment Designs for the Pickle House." Write for this booklet today. Address:

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*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.

MONEL

INCO MONEL

As the Editor Views the News

EVENTS in the first few days of the new year indicate that industry is alert to the psychological effect of encouraging news. Hudson Motor's announcement of its new low-priced car (p. 27) was timed and staged to inspire public confidence. The remarks of William S. Knudsen of General Motors at Washington (p. 20) were constructive. Henry Ford's interview on Friday, stressing a low-priced tractor and possibilities of utilizing farm by-products as materials for mass production manufactures, was optimistic. Industry does well to dramatize its good news in terms of potential employment and of general prosperity which will appeal to the man in the street.

• • •

Encouraging news of even more tangible import is found in the award of 12 tankers to cost $37,566,004 (p. 18), of which the maritime commission will pay $10,563,000 for equipment and accessories to enable these vessels to be used as naval auxiliaries in case of emergency. This award may prove to be the first step in an extensive program for constructing merchant ships designed for possible use as auxiliaries to the navy. Encouraging also is the appearance of a few rail orders (p. 71) to bolster the steelworks operating rate. Production is recovering moderately (p. 21) from the year-end low points.

Tanker Auxiliaries

• • •

In view of the numerous attacks upon business in recent weeks, industry's record of employment in 1937 should be particularly significant. The figures for the steel industry (p. 15) show that employers have done a remarkable job of cushioning the effect of sharply declining production upon the number of jobs and the amount of payrolls. While production dropped 54 per cent from January to November, the number of employes actually increased, the average hourly wage increased from 72.5 to 82.1 cents, the average hours per week declined from 40.5 to 27.6 and total payrolls declined only 18.7 per cent. . . . This study of employment and wages supplements appropriately a statement by the American Iron and Steel institute (p. 16) refuting inaccurate charges made by a government spokesman to the effect that steel price advances have far outrun increased costs and restrict the uses of steel.

Spreading The Work

• • •

A complaint frequently lodged against many government commissions and boards is that they do not adhere consistently to definite rules of procedure. One of the weaknesses of NRA was the constant changing of rules and reversals of decisions, which in the end led to wholesale confusion. The national labor relations board seems to have fallen into this error. Counsel for Bethlehem Steel (p. 17) protests that the board is hearing cases separately that should be consolidated, and that in doing so it is reversing two previous rulings. Such tactics can only lead to confusion and waste of time. They impose unnecessary expense upon employers, are annoying to witnesses and retard instead of promote the cause of justice.

Too Many Changes

• • •

Due to improvements in mechanical equipment, in methods of lubrication and in lubricants themselves, the role of oils and greases in machine bearings is far more important today than a decade ago. This is especially true of greases (p. 36), some types of which carry the responsibility for lubricating the heaviest of modern equipment. . . . "Inventions and Their Protection" (p. 42) is a new book containing important information for inventors and owners of patents who seek the full value of their rights under existing patent laws. . . . Dating kegs of nuts (p. 45) is a minor step in the smoothly functioning routine of operations in a modern bolt and nut manufacturing establishment in Pennsylvania. Sensitive control of materials and an efficient handling system are essentials in economical production in this plant.

Protecting Inventions

E. L. Shaner

WORKABILITY

As INLAND Metallurgists Use the Term

The term "workability" as applied by Inland metallurgists has a broad meaning. It includes all of those physical and metallurgical qualities of a steel sheet that can affect the customer's manufacturing cost. Speed of forming operation, amount of spoilage, wear of dies, suitable finish . . . and other such cost factors are included.

Their long experience with the *hidden costs* of working with steel often results in important savings for Inland customers. Their job is to improve the "workability" of the steel you get from Inland . . . to link every step in the making of your steel more closely to your individual requirements. And their personal attention to your operations and finished products involves no obligation.

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Steel Spreads Work; Number of Employes Holds Up, at High Wage Rates

■ EMPLOYMENT, wage rates and payrolls of the steel industry have held up far better than production and sales so far in this "recession" period.

Steelmakers have tempered the decline for their workers by reviving the share-the-work plan to provide a large majority with earnings, a factual survey by STEEL reveals.

Steel production dropped 54 per cent from 4,724,939 gross tons in January 1937, generally considered an excellent month, to 2,153,781 tons in November, last month for which complete official figures are available. Number of employes, however, actually increased 0.55 per cent from 548,000 in January to 551,000 in November.

Also increased were the average hourly rates of wage earners from 72.5 cents in January to 82.1 cents in November, a gain of 13.2 per cent.

Average hours per week for wage earners dropped from 40.5 hours in January to 27.6 in November, a decrease of 32 per cent. This reflected both restriction of operations and adherence to demands for a shorter work week by labor and the national administration.

Total payrolls, cushioned by wage increases averaging 15 per cent in March, declined only 18.7 per cent from $76,423,000 in January to $62,119,000 in November.

All-time high in steel employment was reached last August when 603,000 were listed on the industry's payrolls. This was only 52,000 more than were employed in November.

The decline in employment is small when compared with the drop in steelmaking, from 83.6 per cent of capacity in August to 37.5 per cent in November.

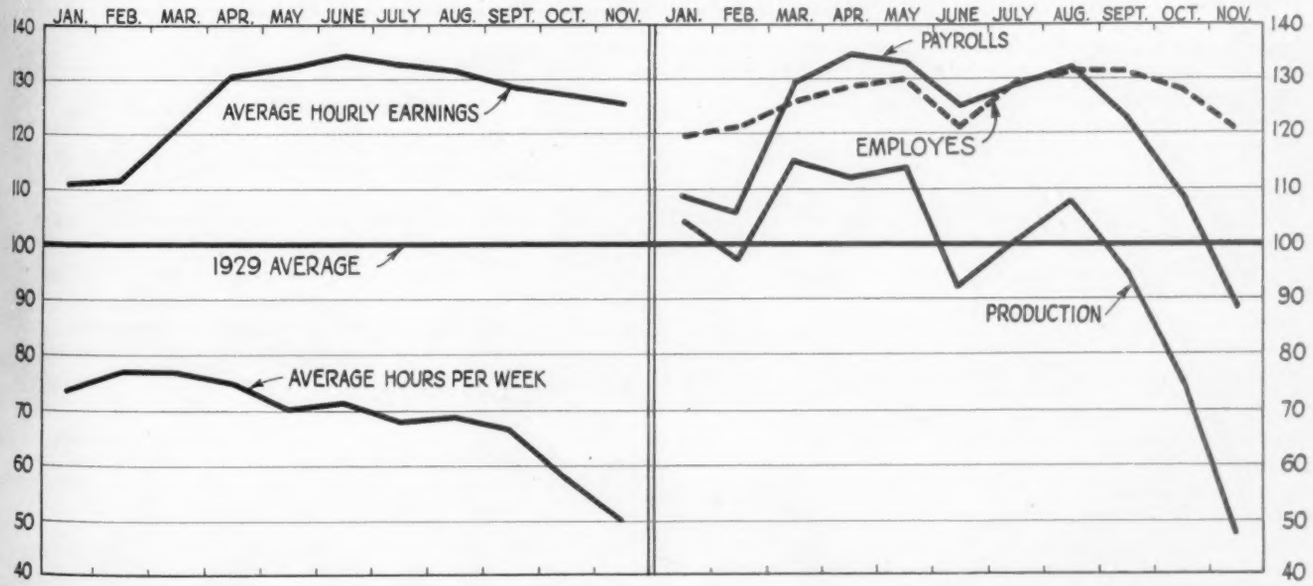
Output fell 56 per cent; number of workers employed only 9 per cent.

The employment figures cited are those compiled by the American Iron and Steel institute from reports of the various companies.

After Labor day dwindling backlogs and scarcity of new buying necessitated sharp curtailment of operations. Number of employed in September, however, showed only a slight drop to 602,700. Total payrolls were off $6,500,000. Average hourly earnings receded slightly as need for overtime work was eliminated; the work week became a little shorter for the same reason.

In October the number of employes dropped to 586,000, less than a 3 per cent decline from September.

Number of Steel Employes Above 1929; Production Far Below



■ **Charted are index figures for number of employes, payrolls, production, average hourly earnings, and average hours worked per week, in the steel industry, January-November, 1937. Monthly average for each of these classifications in 1929 is base, 100. Reduced to simplest terms, the charts show that the number of employes, even through November, latest month for which there are official figures, was at a substantially higher level than in 1929. Average hourly earnings also were well above 1929, this offsetting to a great extent the effect of decline in hours worked per week. Note how ingot production dropped sharply after the "recession" began last September**

Total payrolls were $76,191,000, compared with $86,161,000 in September, a decrease of 11.6 per cent. The tonnage of ingots produced was off 21 per cent from 4,301,869 to 3,392,691.

In November employment declined only 6 per cent from the October total, although November steel production dropped 37 per cent. Steel payrolls in November were 18½ per cent below October, a decline only half as great as the drop in steel output.

What the steelworker lost through the shorter work week was mitigated by increased hourly rates. Two wage advances, one in November 1936 and one in March 1937, amounted in the aggregate to approximately 31 per cent.

First marked upturn in hourly earnings last year came in March when the last general rate advance, averaging about 15 per cent, became effective.

From 72.8 cents in February, average hourly earnings rose to 79.3. In April, the first full month under the increased rates, the average of earnings was 85.6, in May 86.6, in June 87.7, in July 86.8, in August 86.1, September 84.3, October 83.1 and November 82.1. Hourly rates were maintained through the year, the apparent variance in the latter months being due to elimination of overtime work at time and a half over 40 hours a week or eight hours a day.

Peak Payroll in April

Peak payroll total was reached in April with $94,322,000. In May the aggregate wages amounted to $92,931,000. Labor troubles in some plants forced the June total to drop to $87,520,000. Followed a rebound to $90,550,000 in July and to $92,663,000 in August. September tapered to $86,161,000, October to $76,191,000 and November to $62,119,000.

Accompanying the general wage advance in March came a standard 40-hour week of five 8-hour days. Overtime pay of time and a half for time in excess of the standard week was provided.

During the next few months steelmakers, pressed for early deliveries, paid overtime rather freely. In fact the average work week in April was 41.3 hours. Since April the average has been below 40 hours, although many steelworkers continued to receive pay envelopes fattened by overtime rates for the next several months.

Total payrolls for 1937 are estimated at $975,000,000, against $841,000,000 in boom year 1929, an increase of 16 per cent. Average annual income of all steelworkers is estimated at slightly above $1600.

Other comparisons with 1929 show a larger number employed on a shorter work week at considerably higher hourly rates in 1937. Tonnage output was about equal for the first nine months but tapered sharply late last year.

Average monthly production in 1929 was 4,526,023 tons, more than double that of November last year. Yet only 458,000 persons were employed at the peak in 1929 as compared with the 551,000 employed last November.

November's payroll total was only 11.2 per cent under the $70,083,000 monthly average of 1929; hourly earnings were 25.5 per cent higher than the 65.4 cents in 1929. November's average work week was about half the 55-hour average in 1929.

Average monthly output per employe was 19,982 pounds in 1929, 17,262 pounds in January 1937, and only 7818 pounds in November.

Institute Refutes Charge Steel Prices Delay Building Recovery

■ AMERICAN Iron and Steel insittute in a statement last week refuted charges that steel price advances have far outrun increased costs and are delaying the start of a housing program and restricting other uses of steel.

"Widely quoted statements have been made that the extent of wage increases in the steel industry in the past year was only 10 per cent, while prices have advanced 21 per cent," it said.

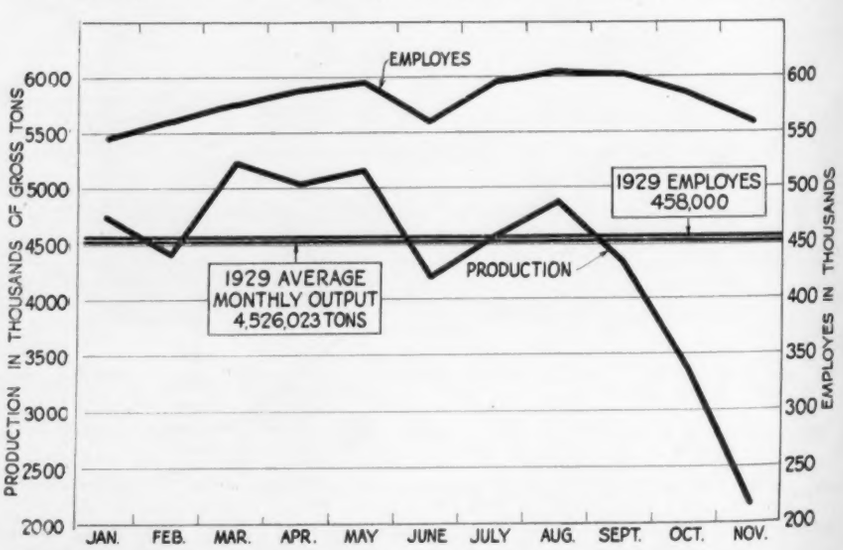
"Wages in the steel industry were increased in November 1936 and again in March 1937. These two wage advances amounted to approximately 31 per cent. They lifted the hourly earnings of steel wage earners to the highest level in the history of the industry, more than 30 per cent over the average in 1929. (See also STEEL'S study of wages and employment in the foregoing article.—Editors)

"Wage advances are far from being the only cause of higher costs. Prices for steel have increased but available statistics show that these advances have been almost completely offset by higher costs not only of labor, but also raw materials, taxes and other expenses.

"While there has been a decline in prices for some of the more speculative raw materials in recent months, it has not been effective in reducing the total cost of producing steel, first, because the industry requires carrying stocks on hand secured at the higher prices and, secondly, because the drop in operations and output more than offsets any saving which could result.

"It is axiomatic that excessive-

Employes on Steel Payrolls, and Output of Ingots



■ **Charted are the actual number of employes on the steel industry's payroll for January-November, 1937, and the tonnage output of steel ingots. Compare with the number of employes and average monthly production in 1929**

ly high prices in any industry must of necessity reflect themselves in high earnings for such industry. The earnings of the steel industry have not been high. They have been low.

"In 1936 the aggregate earnings of the companies comprising this industry represented a return of only about 4½ per cent on investment. For 1937, which was close to the greatest year in history of steel produced, the return on investment is estimated at less than 6 per cent. The increase in return on investment in 1937 over that in 1936 was caused largely by the greater volume of business. During the 10 years 1928-1937—the average rate of return was only 3 per cent on capital investment.

"Assertions that price increases which have occurred in steel are impeding the development of a housing program are unfounded. Approximately 3450 pounds of steel products are required for a typical four-room dwelling of wood frame construction designed (with the land) to sell for approximately $4000. The cost of those steel products on the basis of warehouse prices in the metropolitan district of New York after the price advance in the second quarter of 1937 would have been $260 as compared with $226 in the corresponding quarter of 1936.

Adds Only Mite to Cost

"As shipped from the steel mill, the rolled steel entering into the items which comprise that total would have represented a cost of not more than $103 in the first of those periods, and $133 in April-June 1937.

"Thus the increase in prices at the steel mill would have added only $25, or about six-tenths of 1 per cent, to the selling price of such a dwelling. It seems obvious that any such increase is quite inadequate to act as a deterrent to the construction of dwellings in the low-priced field."

Construction Institute Issues Revised Manual

■ Keeping pace with improvements in material and design, the American Institute of Steel Construction has issued the third revised edition of its Manual on Steel Construction.

The third edition contains much new data indispensable to engineers, architects and others interested in design, fabrication and erection of structural steel for buildings and bridges, the most noted being complete revision of all tables based upon the standard unit stress of 20,000 pounds per square inch.

Labor Board, Reversing Own Rulings, Multiplies Bethlehem Hearings

■ BETHLEHEM Steel Co. will begin Monday in Johnstown, Pa., to present its side of the case before the national labor relations board in the hearings which have been held since last September on allegations of unfair labor practice.

For more than three months witnesses called by the board have been testifying concerning alleged violations of the Wagner act. The board has rested its case on this charge, but it has not yet called witnesses in a second case, which covers an application of the Steel Workers' Organizing committee for certification by the board as the exclusive bargaining agent for Bethlehem employes.

Bethlehem Protests Procedure

The trial is entering its new phase under protest by Bethlehem attorneys that the two cases should be consolidated, and that in trying them separately the board has reversed two previous rulings under which the case was conducted over a period of several weeks.

Bethlehem charged last week, in a petition to the board, that in allowing the cases to be tried separately, the board is imposing undue hardship upon the company and its witnesses, since it will mean duplicating hearings and testimony, with increase in expense to the company and to the employe representation plans which have intervened in the cases.

If the cases are tried separately, three and possibly four hearings will be necessary in each place where testimony is to be taken. Thus far, hearings have been held in Johnstown, Allentown and Baltimore. Furthermore, nearly 10,000 pages of testimony had been taken before the trial examiner, Frank Bloom, ordered Dec. 10 that the cases be tried separately, and the company contends the examiner's reversal of the original ruling was therefore "not timely."

It was also pointed out that during the period between the beginning of the trial and Dec. 10, SWOC had made no attempt to participate in the trials on a consolidated basis, although it had received due notice of the announced intention of the trial examiner to conduct the trials jointly. The hearings were thus permitted by the SWOC to move from plant to plant for several weeks before it sought separate trials.

The company's petition for a consolidation of the trials was denied

Propellers Tipped with Stainless Steel

■ Stainless steel riveted to the backs and tips of these propellers adds strength and offsets corrosive action. Resistance to heat and corrosion and its strength make it superior to the customary brass or wood. Propellers were fabricated by Nicholas-Beazley Airplane Co., Marshall, Mo. Steel is Enduro stainless, product of Republic Steel Corp., Cleveland

last week by the board after the presentation of evidence had been completed on the charge of alleged unfair labor practices by Bethlehem.

On four occasions since last August, Bethlehem's attorneys hold, the NLRB and Mr. Bloom have issued conflicting rulings covering the manner in which the two cases would be tried.

In its original decision issued Aug. 26, the board declared that under its rules the cases would be "consolidated for the purpose of hearing." Sept. 8, Mr. Bloom declared that the two cases would be "heard together and the board will decide independently or possibly it may issue one order in the two cases." Nov. 8, Mr. Bloom ruled in favor of SWOC on a petition that hearings in the second case be adjourned pending the board's decision on the question of whether Bethlehem had discriminated in favor of the employe representation plan.

Mr. Bloom, in turn, was overruled Nov. 17 by the board, which held that the trial of the two cases should be conducted jointly. Nov. 30, Mr. Bloom reaffirmed his ruling providing for separate trials, and last week, the NLRB sustained Mr. Bloom and reversed its own decision of Nov. 17.

Confusion created by this series of conflicting rulings will confer upon the second phase of the trial—Bethlehem's defense against the charge of discrimination—an atmosphere of uncertainty, owing to the possibility of further changes in the board's position on procedure.

95 PER CENT VOTE IN WEIRTON ERP ELECTION

Ninety-five per cent, or 9447 out of 9928 eligible employes, participated in the elections to choose employe representatives for 1938 in Weirton Steel Co., Weirton, W. Va. Approximately 1300 employes were not on active duty in the mills at the time of the elections.

Tom Long, hot mill roller, was named general chairman succeeding Jack Larkin, who had been chairman since inception of the ERP. Larkin's resignation was caused by illness. Leaving his sick bed, he appeared before the general body of representatives, declined nomination for office, expressed appreciation for the fine spirit of fellowship among the representatives, cited the many accomplishments attained for employes.

■ Material obtained from 80 companies including iron and steel, electrical, automotive, foundry, and machine tool manufacturers has been incorporated into a report entitled "Functions of the Personnel Director," issued by the Metropolitan Life Insurance Co., New York.

Place 12 Tankers, Naval Auxiliaries

■ AWARD of 12 oil tankers by Standard Oil Co. of New Jersey, under an agreement with the maritime commission, may be the initial act in a large program of similar awards. Under agreement between the oil company and the commission the new tankers are to be built and equipped to act as naval auxiliaries with sufficient horsepower to attain speeds that will allow them to cruise with the fleet.

The cost of the 12 tankers just awarded will be $37,566,004, of which the commission pays $10,563,000, as its share for the national defense features. The company will operate the tankers at its own expense for 20 years. Payment for the defense features, authorized under the merchant marine act, does not involve a construction subsidy.

The vessels will be powered with engines developing 12,800 horsepower, compared with about 4000 horsepower of commercial tankers. They will be required to develop 18 knots on speed trials and be capable of 16½ knots sustained sea speed. The ordinary tanker makes about 12½ knots. They will be of 16,300 tons dead weight, 525 feet long and have capacity of 150,000 barrels.

Announcement is made by the maritime commission that negotiations are in progress with other oil companies for similar arrangements. The opportunity has been extended to 34 American companies operating tankers to participate in the same agreement.

Shipbuilding has been on the increase the past year and the report of the American Bureau of Shipping shows that while 124 vessels were on the ways Jan. 1, compared with 182 on the corresponding date in 1937, the tonnage of those now building aggregates 300,680 tons against 261,210 tons for last year.

Vessels now being built include the 24,800-ton passenger liner for the United States Lines, under contract by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and three 9000-ton passenger ships for the Panama Railroad & Steamship Co., under construction at the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass.

Three tankers of 11,400 gross tons each are under construction by the Sun Shipbuilding & Dry Dock Co., Chester, Pa., two for the Atlantic Refining Co. and one for the Sun Oil Co. (See also STEEL, Dec. 27, p. 18.)

Shop Workers Make Life Pleasant for Employers

■ Shop employes of Pangborn Corp., Hagerstown, Md., manufacturer of blast cleaning and dust control equipment, acted without suggestion from foreman, superintendent or company officials and presented Thomas W. Pangborn, president; John C. Pangborn, vice president, and George S. Goodrich, general superintendent, with baskets of poinsettia and silver loving cup, water pitcher and service tray for Christmas. The employes did not allow any worker to contribute more than 25 cents. Engraved upon the cup presented to the president was "To Our Chief—Christmas 1937—With a Pledge of Loyalty to the Dean of Employers. — Shop Employes." The other tokens also carried appropriate inscriptions. A shop committee presented the gifts. Left to right in the photo are Charles B. Spigler, Leonard Shank, George Green, Russell Miller, Vernon Stouffer, Mr. Goodrich, Thomas W. Pangborn, John C. Pangborn, Thomas Poffenberger, Ira L. McKee, Thomas Allen and G. LeRoy Piper at the presentation.

1937 Iron Output Best Since 1929; December Drops with 21 Stacks Out

■ WITH a total of 36,709,139 gross tons, production of coke pig iron in the United States in 1937 made the best showing of any year since 1929 which recorded 42,270,183 tons. The gain over the 30,682,704 tons made in 1936 was 6,026,435 tons, or 19.6 per cent.

Production in December continued the precipitous declines of October and November as operating blast furnaces suffered another curtailment of 21 stacks, bringing the active total down to 93 on Dec. 31, the smallest number producing iron since July, 1935, with 92. The high point for 1937 was reached in July with 192, thus the loss in 5 months was 99 furnaces; 88 of this number were taken out in the last three months.

Average daily production in December was 48,499 gross tons, this being the lowest for any month since January, 1935, with 47,692 tons. Compared with the daily rate of 66,901 tons in November, this was a loss of 18,402 tons, or 27.5 per cent. The December rate also was the lowest for any December since 1934, with 33,161 tons; the rate in December, 1936, was 100,813 tons.

Total output for December amounted to 1,503,474 gross tons and likewise made the poorest showing for any month since January, 1935, with 1,478,443 tons. Against the 2,007,031 tons made in November, the loss was 503,557 tons, or 25.1 per cent, despite the fact that December was a one-day longer month. The December total was the smallest for any December since 1934 with 1,028,006 tons; the figure for December, 1936, was 3,125,192 tons.

Relating production to capacity, the rate of operation in December was 35.6, compared with 49.1 in November. The year's high point was 85.7 in August. The figure for December, one year ago, was 74.2.

The 93 blast furnaces making iron on Dec. 31 compares with 114 on Nov. 30, 151 on Oct. 31, 181 on Sept. 30, 191 on Aug. 31 and 192 on July 30, the latter being the year's peak. Total potential blast furnaces in the country total 237. During December, three steelworks or nonmerchant stacks resumed activity and 19 were blown out or banked, making a net loss of 16 for this class. Of the merchant group, no stacks resumed and five were taken out.

Furnaces blowing in during December were: In Pennsylvania: Cambria J, Bethlehem Steel Co. In Indiana: Madeline No. 2, Inland Steel Co. In Utah: Provo, Columbia Steel Co.

Stacks blowing out or banking were: In Ohio: River No. 2 and Youngstown No. 2, Republic Steel Corp.; Trumbull Cliffs, Trumbull-Cliffs Furnace Co.; Toledo A, Interlake Iron Corp.; one Mingo, one Ohio and one Clairton, Carnegie-Illinois Steel Corp. In Pennsylvania: Perry, Interlake Iron Corp.; Cambria E and F, Bethlehem Steel Co.; Monessen, Pittsburgh Steel Co. In New York: Troy, Troy Furnace Co. In Maryland: Maryland C, Bethlehem Steel Co. In Alabama: Pioneer No. 1, Republic Steel Corp.; Ensley No. 1 and No. 2, Tennessee Coal, Iron & Railroad Co. In Virginia: Reusens, Lavino Furnace Co. In West Virginia: Riverside, Wheeling Steel Corp.; one Weirton, National Steel Corp. In Colorado: One Minnequa, Colorado Fuel & Iron Co. In Illinois: South Works Old No. 4 and E, Carnegie-Illinois Steel Corp. In Indiana: Gary No. 8, Carnegie-Illinois Steel Corp. In Michigan: One Detroit, National Steel Corp.

MONTHLY IRON PRODUCTION

Gross Tons

	1937	1936	1935
Jan.	3,219,741	2,029,304	1,478,443
Feb.	3,020,006	1,838,932	1,614,905
March	3,470,470	2,046,121	1,770,990
April	3,400,636	2,409,474	1,671,556
May	3,545,180	2,659,643	1,735,577
June	3,115,302	2,596,528	1,558,463
July	3,501,359	2,595,791	1,520,340
Aug.	3,616,954	2,711,726	1,759,782
Sept.	3,417,960	2,728,257	1,770,259
Oct.	2,891,026	2,991,794	1,978,379
Nov.	2,007,031	2,949,942	2,066,293
Dec.	1,503,474	3,125,192	2,115,496
Total	36,709,139	30,682,704	21,040,483

AVERAGE DAILY PRODUCTION

Gross Tons

	1937	1936	1935	1934
Jan.	103,863	65,461	47,692	39,537
Feb.	107,857	63,411	57,675	45,385
March	111,951	66,004	57,120	52,438
April	113,354	80,316	55,719	57,873
May	114,360	85,795	55,986	66,370
June	103,843	86,551	51,949	64,563
July	112,947	83,735	49,043	39,630
Aug.	116,676	87,475	56,767	34,199
Sept.	113,932	90,942	59,009	29,969
Oct.	93,259	96,509	63,818	30,689
Nov.	66,901	98,331	68,876	31,930
Dec.	48,499	100,813	68,242	33,161
Ave.	100,573	83,832	57,694	43,774

DECEMBER IRON PRODUCTION

	No. in blast last day of Dec.	Nov.	Total tonnage Merchant	Nonmerchant
Ohio	20	26	79,035	229,108
Penna.	29	33	64,570*	324,337*
Alabama	11	14	71,837*	93,696*
Illinois	7	9	68,876	73,916
New York	8	9	60,319	63,270
Colorado	1	2		
Indiana	7	7	23,239*	219,684
Maryland	3	4		
Virginia	0	1		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	0	3,276	128,311
West Va.	1	3		
Michigan	3	4		
Minnesota	1	1		
Missouri	0	0		
Total	93	114	371,152*	1,132,322*

*Includes ferro and spiegeleisen.

RATE OF OPERATION

(Relation of Production to Capacity)

	1937[1]	1936[2]	1935[3]	1934[4]
Jan.	76.6	48.2	34.2	28.3
Feb.	79.5	46.6	41.4	32.5
March	82.5	48.5	41.0	37.5
April	83.7	59.1	40.0	41.4
May	84.3	63.1	40.2	47.5
June	76.6	63.6	37.2	46.3
July	82.9	61.5	35.2	28.4
Aug.	85.7	64.3	40.7	24.5
Sept.	83.7	66.9	42.5	21.5
Oct.	68.4	71.0	45.8	22.1
Nov.	49.3	72.3	49.5	22.8
Dec.	35.6	74.2	49.0	23.7

[1]First half based on capacity of 49,512,737 gross tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [2]capacity of 49,777,893 tons, Dec. 31, 1935; [3]capacity of 50,845,741 tons, Dec. 31, 1934; [4]capacity of 50,975,561 tons, Dec. 31, 1933. Capacities by American Iron and Steel Institute.

Fourth New Freighter Launched for U. S. Steel

■ The JOHN HULST, last of the four new ore carriers built for the Pittsburgh Steamship Co., subsidiary of the United States Steel Corp., slid down the ways at the River Rouge yards of the Great Lakes Engineering Co., Jan. 8.

Named for a vice president of the steel corporation, the freighter was sponsored by Miss Helen McDonough of the Pittsburgh Steamship Co.

The new ship is identical in construction and equipment to the RALPH H. WATSON, launched at River Rouge in November. Two sister ships, the WILLIAM A. IRVIN and the GOVERNOR MILLER, were launched late last year at the American Ship Building Co. yards at Lorain, O.

■ Simplified practice recommendation R-78-28, iron and steel roofing, has been reaffirmed without change by the standing committee of the industry, according to the national bureau of standards.

MEETINGS

TOOL ENGINEERS PLANNING CONVENTION AND SHOW

■ ALTHOUGH organized since 1932, American Society of Tool Engineers will hold its first national convention in Detroit, March 9-12, and in connection with it a machine and tool progress show. The exhibition, to be held in Convention Hall, will feature machinery, tools, production equipment and materials, and is timed to coincide with the beginning of peak buying seasons in mass production industries. Reservations for space are now being made.

Organized to provide a technical organization for production men responsible for the use of machines, tools and equipment in the mass production industries, the society has grown rapidly and has doubled its membership in each of the past two years. Frank A. Shuler, master mechanic, Chrysler Corp., Detroit, is national president, and Ford R. Lamb, 5928 Second boulevard, Detroit, is executive secretary.

OPEN FORUMS TO FEATURE SCRAP INSTITUTE MEETING

Internal problems of the scrap industry and their relation to the steel industry will be featured in open forum discussions at the tenth annual convention of the Institute of Scrap Iron and Steel at the Ambassador hotel, Atlantic City, N. J., Jan. 12-14.

In the forum sessions, President M. V. Bonomo, Schiavone-Bonomo Corp., will review ten years of institute progress; C. E. Wright, managing editor, *Iron Age*, will discuss phases of the scrap situation; Sam Bassow, Bassow Bros., will report on results of a survey on scrap from the dealer's viewpoint; T. E. Herrick, vice president, Cleveland Trust Co. will discuss scrap from a banker's point of view; and C. G. Smith, manager, New York state insurance fund, will deal with compensation insurance, a problem now agitating the scrap industry.

OHIO FOUNDRY GROUP TO HEAR EQUIPMENT MAKERS

New and interesting developments in foundry equipment will be described at the monthly dinner meeting of the Northeastern Ohio chapter of the American Foundrymen's association at the Cleveland club, Cleveland, Jan. 13. A number of speakers representing foundry equipment manufacturers will discuss improvements in various classes of equipment, their presentations to be followed by a question and answer period. The program is being arranged by Arthur J. Tuscany, executive secretary, Foundry Equipment Manufacturers' association, Cleveland.

HAZELETT TO SPEAK AT NEW YORK MEETING

An address, "The Direct Fabrication of Molten Metals," will be presented by C. W. Hazelett, originator of the Hazelett process and chairman of Hazelett Metals Inc., New York, before the New York chapter of the American Society for Metals, Buildings Trades club, 2 Park avenue, Monday evening, Jan. 10. An important discussion of the subject will be contributed by E. M. Wise, assistant manager, International Nickel Co.'s research laboratory, Bayonne, N. J., one of Mr. Hazelett's associates.

Knudsen Tells What GM Has Done for Labor

■ Terming the drop in new and used car sales since Nov. 20 "The most severe experienced in the history of General Motors," W. S. Knudsen, president of General Motors Corp., last week told the senate committee on unemployment relief that the sudden slump was wholly unexpected and entirely beyond control of the corporation.

Progressive curtailment of production schedules has resulted in an accumulation of inventories, principally parts and subassemblies, of $290,000,000, nearly 30 per cent in excess of the figure for the end of 1936. Nevertheless, Mr. Knudsen pointed out that the average annual wage of General Motors employes in 1937 was about $1650 for the 80 per cent of the men who worked full time.

Capital expenditures for 1937 totaled $100,000,000, of which about $75,000,000 has been spent, the balance to be spent this year, plus usual tool expenditures amounting to an additional $20,000,000. Expansion last year was aimed to take care of the shorter work week agreed to with labor and in expectation of business equal to that of last year. But, Mr. Knudsen declared, the corporation's new plants built last year "will have to remain idle until business conditions improve."

Twenty-Six Railroads Co-operate in Exhibit

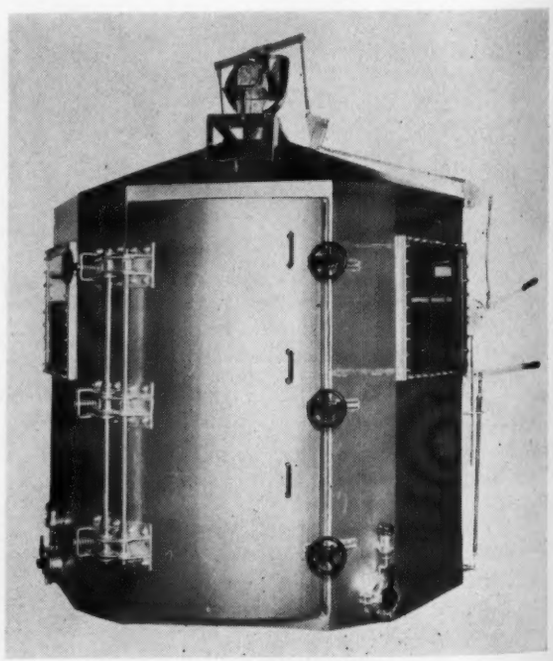
■ Growth and progress of American railroads will be depicted at the 1939 New York World's fair in an exhibit sponsored by 26 eastern railroads.

Models, dioramas, a complete operating railroad system in miniature, moving pictures, carriers' exhibits, and a pageant drama, "Railroads on Parade," will be housed in a separate building which includes an amphitheater seating 4000.

American railroads, sponsoring exhibit on a co-operative basis for the first time, are planning to persuade railway supply manufacturers to do likewise and thus give a complete picture of the American railway system.

Lethal Chamber Has All-Steel Construction

■ Steel finds grim application in this execution chamber, duplicates of which have been made for Colorado, Wyoming, Missouri, Oregon, and California by Eaton Metal Products Co., Denver. Eight feet in diameter, 7 feet high with an 18-inch cone roof, the chamber has a ¼-inch ribbed steel bottom, 3/16-inch steel sides, and a top of No. 10 gage steel. A battleship bulkhead type door prevents air leakage, while the cylindrical shape assists rapid exhaustion of gases after executions



PRODUCTION

■ GENERAL resumption of steelmaking after the holiday interruptions of the two preceding weeks brought the national steel operating rate up 5 points last week to 26 per cent, practically on the level of mid-December. Practically all districts showed gains and schedules for this week in most cases call for some further increase.

Youngstown, O. — Up 10 points to 24 per cent, with prospects for a slight advance this week. Several idle plants have resumed on accumulations of orders.

Pittsburgh—Increased 10½ points to 25½ per cent, to care for accumulated tonnage. No schedule formed for this week, depending on current business.

Wheeling — Gained 7 points to 26 per cent. Further rise expected for this week when another open hearth will be lighted.

New England — Unchanged at 19 per cent. Schedule for this week calls for a rate of 26 per cent.

Detroit — Unchanged at 33 per cent, with seven furnaces active. Additional units may be lighted this week.

Chicago — Increased 2 points to 24½ per cent, the best rate in four weeks. Need for semifinished steel stocks may cause more open hearths to be lighted this week.

Cincinnati — All open hearths were idle last week, prolonging the holiday shutdown. A rate of 30 per cent is scheduled for this week.

Central eastern seaboard — Up 1 point to 31 per cent. One plant added two furnaces last week and will light another this week.

St. Louis — Addition of two open hearths brought the operating rate last week up 9 points to 21 per cent.

Birmingham, Ala. — Steady at 63 per cent, with 12 open hearths operating.

Buffalo — Up 7 points to 23 per cent, with three additional open hearths in service.

Cleveland — Advanced 8 points to 26 per cent, as a result of full week operation of active units. One additional open hearth has been lighted.

Canadian Imports Gain; Machinery Leads List

■ Canada's iron and steel imports increased sharply in November, with total value of $20,051,000, compared with $12,456,000 in November, 1936. Value of imports from the United States rose from $9,436,000 to $15,562,000. Machinery led the list, with value of $14,159,000.

Other imports from the United States included automobile parts, $3,410,000; automobiles, $1,541,000; plates and sheets, $1,034,000; engines and boilers, $1,006,000; farm implements, $893,000; miscellaneous rolling mill products $623,000; castings and forgings, $268,000; tubes and pipes, $166,000; tools, $125,000; hardware and cutlery, $115,000; stamped and coated products, $106,000.

Exports for November were only slightly higher than for the corresponding month of the previous year, totaling $5,131,000, against $5,095,000. The value of exports to the United States declined from $658,000 to $401,000.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Jan. 8	Change	Same week 1937	Same week 1936
Pittsburgh	25.5	+10.5	80	40
Chicago	24.5	+ 2	77	51.5
Eastern Pa.	31	+ 1	53	35.5
Youngstown	24	+10	78	62
Wheeling	26	+ 7	94	68
Cleveland	26	+ 8	80	60
Buffalo	23	+ 7	84	50
Birmingham	63	None	76	41
New England	19	None	85	83
Cincinnati	0	—36	96	†
St. Louis	21	+ 9	80	†
Detroit	33	None	95	88
Average	26	+ 5	79.5	51.5

†Not reported.

December Ingots Down 32 Per Cent

■ PRODUCTION of 1,472,241 gross tons of open-hearth and bessemer steel ingots in December, although representing the lowest monthly output in 39 months, brought the year's output to 49,507,766 gross tons, third greatest annual tonnage in history, according to the American Iron and Steel institute.

The 1937 total exceeds the 46,807,780 tons produced in 1936 by nearly 6 per cent, but was below output in 1928 and 1929, which was 49,865,185 and 54,312,279 tons, respectively.

December production was equivalent to 25.36 per cent of capacity, while for the year, steel operations averaged 72.39 per cent.

December output declined nearly 32 per cent from the November total of 2,153,781 gross tons, and was 67 per cent below the December, 1936, output of 4,424,367 tons.

STEEL's weekly estimates of operations for December averaged 25.62 per cent of capacity, compared with the actual average of 25.36 per cent. Estimate of total ingot production for 1937 was within 100,000 tons of the actual total.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.03 per cent

	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
1937								
Jan.	4,433,145	84.20	291,749	54.29	4,724,894	81.43	1,066,567	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
March	4,812,879	91.42	403,364	75.06	5,216,243	89.90	1,177,481	4.43
April	4,681,677	91.83	388,768	74.70	5,070,445	90.24	1,181,922	4.29
May	4,767,269	90.55	382,582	71.19	5,149,851	88.76	1,162,495	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	335,440	62.56	4,556,001	78.48	1,030,769	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	268,433	51.70	4,298,354	76.46	1,004,288	4.28
Oct.	3,203,447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
Nov.	2,040,020	39.89	113,761	21.86	2,153,781	38.22	502,047	4.29
Dec.	1,385,406	26.29	86,835	16.20	1,472,241	25.36	333,086	4.42
Total	46,057,921	74.21	3,449,845	54.54	49,507,766	72.39	949,516	52.14
1936								
Jan.	2,843,415	54.76	196,389	32.21	3,039,804	52.39	686,186	4.43
Feb.	2,754,446	56.76	202,445	35.55	2,956,891	54.53	714,225	4.14
March	3,148,813	60.64	185,040	30.33	3,333,853	57.46	752,563	4.43
April	3,627,830	72.14	304,775	51.62	3,932,605	69.99	914,593	4.29
May	3,735,283	71.93	302,092	49,55	4,037,375	69.58	911,371	4.43
June	3,640,672	72.40	334,897	56.72	3,975,569	70.75	926,706	4.29
July	3,587,764	69.25	326,606	53.69	3,914,370	67.61	885,604	4.42
Aug.	3,833,727	73.83	350,560	57.50	4,184,287	72.11	944,534	4.43
Sept.	3,848,340	76.71	303,048	51.45	4,151,388	74.05	969,950	4.28
Oct.	4,216,536	81.20	317,710	52.11	4,534,246	78.15	1,023,532	4.43
Nov.	3,993,472	79.42	329,553	55.82	4,323,025	76.94	1,007,698	4.29
Dec.	4,119,025	79.50	305,342	50.20	4,424,367	76.42	1,000,988	4.42
Total	43,349,323	70.74	3,458,457	48.07	46,807,780	68.36	895,329	52.28

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62 160,362 gross tons bessemer, 6,325,000 gross tons; for 1936, on weekly capacities of 1,172,160 gross tons open-hearth ingots, 137,624 tons bessemer, 1,309,784 tons total, based on annual capacities as of Dec. 31, 1935, as follows: Open-hearth ingots 61,280,509 gross tons, bessemer 7,195,000 gross tons.

MEN OF INDUSTRY

■ J. HALSEY McKOWN, heretofore assistant to vice president and general manager of sales, Carnegie-Illinois Steel Corp., has been appointed assistant vice president, United States Steel Corp. of Delaware, under C. V. McKaig, vice president in charge of sales.

David F. Austin, who has been manager of sales, Chicago district, Carnegie-Illinois Steel Corp. since November, 1935, succeeds Mr. McKaig as vice president in charge of sales of Carnegie-Illinois. Other executive changes in the Carnegie-Illinois sales department include the following: Thomas J. Hilliard has been named general manager of sales, the position formerly held by Mr. McKown under the title assistant vice president and assistant general manager.

Philip M. Guba, who became associated with Carnegie-Illinois in March, 1933, as assistant manager of sales at the Detroit office and was appointed manager of sales at that office in March, 1935, has been named manager of sales, Chicago district, succeeding Mr. Austin.

Francis C. Hardie, manager of sales at Cleveland for Carnegie-Illinois since 1932, has been transferred to Detroit as manager of sales, succeeding Mr. Guba.

Thomas J. Bray Jr., identified with the steel industry since graduation from Lehigh university, has become manager of sales, Pittsburgh office, succeeding Mr. Hilliard.

F. Royal Gammon, who joined the New York sales office of Carnegie-Illinois in April, 1936, has been named manager of sales at Cleveland, succeeding Mr. Hardie.

♦

J. Paul Arens, has been made works manager, Ceco Steel Products Co., Chicago. He formerly was general superintendent, Youngstown plant, Truscon Steel Co.

J. Halsey McKown

♦

F. W. Cederleaf has been named general manager, Diesel Equipment Corp., Chicago.

♦

Charles B. Collins, who has been located at St. Louis as assistant vice president, American Car & Foundry Co., New York, has resigned.

♦

Arthur J. Seeger, formerly treasurer and general superintendent, Stanek Tool & Mfg. Co., Milwaukee, has been elected president to succeed the late Edward J. Stanek.

♦

John F. Cunningham, supervisor of production, General Electric Co., Schenectady, N. Y., since September, 1931, has become assistant to the vice president in charge of manufacturing, succeeding Myron F. Simmons, retired. Mr. Cunningham started with the company in August, 1901.

♦

P. H. MacGregor, general plant manager, Pontiac Motor Car Co., has been promoted to general manufacturing manager. R. H. Ahlers has been named to Mr. MacGregor's former position.

♦

W. W. Cochrane has been appointed representative in the Milwaukee territory for the Union Wire Rope Corp., with headquarters in the Underwriters Exchange building.

♦

Earle A. Mann., for the past several years district sales manager at Chicago for the Standard Brake Shoe & Foundry Co., Memphis, Tenn., and Pine Bluff, Ark., has been appointed director of sales, headquarters at Pine Bluff.

♦

Benjamin Schwartz, director-general, Institute of Scrap Iron and Steel Inc., New York, was elected national president of the Sigma Alpha Mu fraternity at its twenty-eighth annual convention in Cleveland Jan. 1.

♦

Ralph H. Petillon, associated with Western Pipe & Steel Co., San Francisco, for 25 years, the last 20 as purchasing agent, has resigned to become manager of the San Francisco branch of Ducommun Metals & Supply Co.

♦

John F. McCormack, foundry superintendent at the Vandergrift, Pa., plant of United Engineering & Foundry Co., since June, 1923, has been promoted to superintendent in charge of the Vandergrift plant. Prior to joining the United company in 1907, he was associated with the

T. J. Hilliard

D. F. Austin

Philip M. Guba

F. C. Hardie

T. J. Bray Jr.

F. R. Gammon

Youngstown Steel Casting Co. and Duquesne Steel Foundry Co.

♦

David F. Mann, identified with the sales department of Pittsburgh Steel Co. since 1913, being Chicago district manager from 1923 to 1935, and since then New York district manager, has been transferred to Pittsburgh as assistant district sales manager.

♦

Harvey F. Hedrick, plant superintendent, Judson-Pacific Steel Co., San Francisco, recently was guest of honor at a banquet tendered by his associates, in commemoration of his completion of 50 years' continuous service with the company and its predecessor.

♦

George Campbell, manager of the Schenectady, N. Y., sales office of General Electric Co., has also assumed the management of the Syracuse office. Mr. Campbell succeeds A. J. Hornsby in the Syracuse area, who retired Dec. 31 after 38 years of service with the company.

♦

Frank A. Troxel, heretofore chief engineer, Aliquippa works, Jones & Laughlin Steel Corp., Pittsburgh, sailed recently for Wales to join the staff of Richard Thomas Steel Co. Ltd. He will become chief engineer of the company's new hot and cold strip mill at Ebbw Vale, Wales, which is now under construction.

♦

John J. Conn has been appointed general purchasing agent, Atchison, Topeka & Santa Fe railroad. Mr. Conn, who succeeds the late M. J. Collins, began work with the Santa Fe as office boy in the purchasing department in 1889. He was made assistant general purchasing agent in 1910.

♦

Albert Reichmann, who supervised designing of many of the country's largest steel structures, has retired from the American Bridge Co., Pittsburgh, after 36 years' continuous service. He had been vice president since 1935. Until April 1, 1931, he was western division engineer with offices in Chicago, and from that time to June, 1935, was assistant chief engineer. He has served as president, Western Society of Civil Engineers and as director, American Society of Civil Engineers.

♦

Geoffrey E. Bennett has been made general manager, Toledo Scale Co., Toledo, O. Since 1931 Mr. Bennett has had general supervision of the shop and engineering phases of the business, and his new position will extend his responsibilities to cover other departments.

Grant M. Richards, associated with the company since 1914, has been named plant superintendent.

♦

John A. Coakley, general traffic manager of the manufacturing subsidiaries and mining companies of the United States Steel Corp. in the Pittsburgh and Chicago districts, resigned Jan. 1, after 38 years' continuous service. William S. Guy, traffic manager of the eastern district for the manufacturing subsidiaries and mining companies of the corporation, has been appointed acting traffic manager of the United States Steel Corp. of Delaware, with headquarters in Pittsburgh. Mr. Guy was made assistant traffic manager of the Carnegie Steel Co. in 1912 and in May, 1928, was appointed traffic manager of the same company.

♦

Lesley C. Paul, for the past five years manager of the Westinghouse Electric & Mfg. Co.'s press bureau at East Pittsburgh, Pa., has been transferred to the Springfield, Mass. district, representing the East Springfield and Chicopee Falls plants and the district sales office in their relations to the local press, and also in charge of promotion of the company's radio stations. His headquarters will be in the radio

(*Please turn to Page* 88)

■ GERARD SWOPE, president, General Electric Co., chatting with Philip D. Reed (left), newly named assistant to the president, and Charles E. Wilson (right), new executive vice president. Appointment of Mr. Reed and Mr. Wilson was announced in STEEL, Dec. 20, p. 31

Tin Plate Makes New Export High

■ ALTHOUGH exports of steel, excluding scrap, in November were slightly lower than in October, the total for 11 months greatly exceeded that for the corresponding period of 1936 and also the 11-month total for 1929. The feature of the export market in 1937 was the all-time high in tin plate, which passed the previous high mark in 1929, the total for 11 months of 1937 being greater than for all 1929.

November steel exports, exclusive of scrap, totaled 301,280 gross tons, valued at $23,752,977, a decline of 10.6 per cent in volume and an increase of 1.9 per cent in value compared with October. Compared with November, 1936, volume increased 136.8 per cent and value 174.5 per cent.

In November 52,795 tons of tin plate was exported, the largest monthly total ever recorded. In October tin plate exports were 36,098 tons and in November, 1936, they were 20,577 tons.

Steel ingots, blooms and other semifinished forms were second in volume at 36,231 tons, compared with 35,948 tons in October. Steel plates were third with 35,908 tons, compared with 59,085 tons. Pig iron exports were 26,225 tons, against 66,297 tons in October.

Exports, excluding scrap, for 11 months totaled 3,165,343 gross tons, valued at $202,836,996, compared with 1,086,062 tons, valued at $78,018,825, for the 11 months of 1936. This is an increase of 191.5 per cent in volume and 160 per cent in value.

Tin plate shipments in 11 months of 1937 were 322,975 tons, in contrast with 258,965 tons in all 1929. The value of the tin plate exported in 11 months of 1937 was $35,628,720, by far the largest value for any iron or steel product, except scrap.

Scrap exports, after declines for two consecutive months, moved up in November to 255,311 tons, valued at $4,254,102, compared with 185,618 tons, valued at $3,541,123, in October. This was a gain of 37.5 per cent in volume and 20.1 per cent in value. For 11 months scrap exports aggregated 3,776,123 tons, valued at $73,875,076, compared with 1,827,088 tons, valued at $23,064,161, in the corresponding period of 1936.

Steel imports in November were 26,996 tons against 37,186 tons in October, and 61,970 tons in November, 1936. For 11 months of 1937 imports totaled 508,258 tons, compared with 614,245 tons in the corresponding portion of 1936.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1937 Imports	1937 Exports	1936 Imports	1936 Exports
Jan.	43,063	201,692	50,489	241,564
Feb.	41,628	290,987	43,358	213,802
March	51,805	570,584	56,720	264,337
April	68,197	683,674	49,277	301,987
May	49,050	969,222	59,391	314,950
June	44,771	826,534	59,910	294,951
July	47,012	889,438	47,490	296,738
Aug.	61,489	836,319	60,697	295,341
Sept.	37,071	543,740	59,993	235,784
Oct.	37,186	522,611	64,509	261,882
Nov.	26,996	556,591	61,970	203,297
11 mos.	508,258	6,941,466	614,245	2,913,150
Dec.	.....	.....	52,584	244,156
Total	.....	.....	666,838	3,162,694

ORIGIN OF NOVEMBER IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	8,007	.....	.....	304
Sweden	37,951	.....	.....	.....
United Kingdom	247	.....	.....	.....
Canada	167	374	.....	.....
Cuba	22,000	.....	5,413	.....
Chile	85,600	.....	.....	.....
Australia	5,002	.....	.....	.....
Netherlands	.....	1,001	.....	.....
British India	.....	5,286	.....	.....
France	.....	.....	16	46
Soviet Russia	.....	.....	3,875	.....
Gold Coast	.....	.....	6,939	.....
Total	158,974	6,661	16,243	350

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
United Kingdom	1	27	50	3
Belgium	49	3,643	1,098	1,404
Germany	5	119	39	79
Sweden	2	...	439	1
France	.....	179	78	95
Canada	.....	.....	1	.....
Austria	.....	.....	11	.....
Czechoslovakia	.....	.....	8	.....
Paraguay	.....	.....	87	.....
Total	57	3,968	1,811	1,582

U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Nov. 1937	Oct. 1937	Jan. thru Nov.'37
Pig iron	6,661	11,870	102,569
Sponge iron	101	24	2,535
Ferromanganese**	350	656	23,566
Spiegeleisen	438	222	17,554
Ferrochrome*†	.....	20	260
Ferrosilicon*‡	138	345	2,867
Other ferroalloys*§	.....	...	52
Steel ingots, blooms	.....	6	130
Billets	33	335	1,854
Concrete reinf. bars	43	14	3,809
Hollow bar, drill steel	188	295	2,347
Bars, solid or hollow	1,811	1,928	41,729
Iron slabs	.....	.....	1
Iron bars	123	116	1,866
Wire rods	1,405	1,282	15,184
Boiler, other plate	1	9	214
Sheets, skelp, saw plate	57	142	8,542
Die blocks or blanks	3	5	101
Tin plate, taggers' tin and terne plate	27	15	233
Structural shapes	3,968	4,097	72,617
Sashes, frames§	.....	.....	.....
Sheet piling	.....	.....	2,161
Rails and fastenings	320	140	8,133
Cast-iron pipe, fittings	514	113	3,243
Mall'ble iron pipe ftgs.	12	...	416
Welded pipe	713	615	8,792
Other pipe	2,082	1,166	30,811
Cotton ties	.....	.....	454
Other hoops, bands	1,582	1,310	24,819
Barbed wire	1,446	2,367	16,075
Round iron, steel wire	250	308	4,381
Teleg., telephone wire	.....	1	17
Flat wire and strips	669	288	3,771
Wire rope and strand	188	309	3,315
Other wire	97	99	3,182
Nails, tacks, staples	552	1,010	14,599
Bolts, nuts, rivets	16	69	562
Horse and mule shoes	18	38	397
Castings and forgings	179	288	4,158
Total gross tons	23,985	29,502	427,316
Iron and steel scrap	3,011	7,684	80,952
GRAND TOTAL	26,996	37,186	508,268

**Manganese content; *†chrome content; *‡silicon content; *§alloy content; §formerly included with "Structural shapes".

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Nov. 1937	Oct. 1937	Jan. thru Nov.'37
Pig iron	26,225	66,297	745,891
Ferromanganese and spiegeleisen	57	3	1,686
Other ferroalloys	80	235	2,418
*Ingots, blooms, etc.			
Not containing alloy	36,064	35,730	264,045
Alloy incl. stainless	167	218	7,161
Bars, iron	155	45	2,156
Bars, concrete	1,215	1,407	15,620
*Other steel bars:			
Not containing alloy	15,595	12,562	117,317
Stainless steel	4	9	193
Alloy not stainless	482	466	5,814
Wire rods	6,445	7,182	57,195
Boiler plate	1,431	2,804	9,659
*Other plates not fab.:			
Not containing alloy	31,486	52,105	349,760
Stainless steel	....	4	143
Alloy not stainless	2,584	14	4,988
Skelp	1,965	3,892	75,854
Sheets, galv. iron	483	347	4,800
Sheets, galv. steel	6,680	7,841	69,583
*Sheets, "black" steel:			
Not containing alloy	25,814	27,273	258,988
Stainless steel	406	42	1,453
Alloy not stainless	30	81	4,654
Sheets, black iron	596	1,331	10,408
*Strip steel, cold-rolled:			
Not containing alloy	3,327	2,327	30,599
Stainless steel	65	89	496
Alloy not stainless	61	64	580
*Strip steel, hot-rolled:			
Not containing alloy	3,650	5,388	70,477
Stainless steel	1	14	117
Alloy not stainless	1	3	516
Tin plate, taggers' tin	52,795	36,098	322,975
Terne plate	212	332	4,636
Tanks, except lined	3,099	4,521	32,064
Shapes, not fabricated	9,689	8,650	127,643
Shapes, fabricated	4,830	4,514	35,410
Plates, fabricated	407	4,158	21,887
Metal lath	81	93	1,733
Frames and sashes	228	158	1,637
Sheet piling	378	1,635	6,784
Rails, 60 pounds	22,615	8,308	83,041
Rails, under 60 pounds	497	172	9,863
†Rails, relaying	3,363	5,940	26,682
Rail fastenings	3,440	1,703	12,834
Switches, frogs, etc.	168	80	2,140
Railroad spikes	159	450	2,835
R. R. bolts, nuts, etc.	48	112	1,039
Boiler tubes, seamless	3,438	2,895	15,769
Boiler tubes, welded	1	212	639
Pipe:			
Seamless casing and oil-lines	7,497	7,735	68,308
Do. Welded	60	1,139	6,719
Smls. black, ex. csg.	592	975	11,628
Pipe fittings:			
Mall. iron screwed	724	632	5,117
Cast iron screwed	170	250	2,827
Pipe and fittings for:			
Cast-iron pressure	1,125	971	19,310
Cast-iron soil	711	393	6,733
Pipe, welded:			
Black steel	1,962	1,138	20,115
Black wrought iron	109	389	4,229
Galvanized steel	855	957	16,802
Galv. wrought iron	128	227	1,945
Pipe and fittings:			
Riveted iron or steel	255	24	787
Wire:			
Plain iron or steel	2,230	2,507	31,340
Galvanized	1,002	2,061	21,864
Barbed	1,717	2,763	32,105
Woven wire fencing	90	231	2,899
*Woven screen cloth:			
Insect	8	62	531
Other	58	49	953
‡Wire rope	358	486	6,009
‡Wire strand	61	71	1,194
†Card clothing	2	2	47
Other wire	475	680	8,165
Wire nails	685	704	15,729
Horseshoe nails	105	79	871
Tacks	46	41	375
Other nails, staples	187	279	2,772
Bolts, etc.	779	937	10,421
Castings:			
Gray iron, semi-steel	224	352	5,109
Malleable iron	160	263	4,010
Steel, not alloy	106	246	2,026
Alloy incl. stainless	68	199	1,503
Car whls., tires, axles	7,382	1,437	21,426
Horseshoes and calks.	2	4	175
*Forgings, n.e.s.:			
Not containing alloy	797	801	8,503
Alloy incl. stainless	33	105	814
Total	301,280	336,993	3,165,343
Scrap, iron and steel	254,072	184,547	3,720,127
Scrap, tin plate	716	278	13,806
†Tin pl. circles, strips, cobbles, etc.	58	60	12,778
Waste-waste tin plate	465	733	29,412
Total scrap	255,311	185,618	3,776,123
GRAND TOTAL	556,591	522,611	6,941,466
Iron ore	36,557	167,132	1,266,405

*No comparisons available; †new class; ‡no distinction prior to 1937.

Machinery Exports Gain 58 Per Cent in November

■ United States exports of industrial machinery in November totaled $21,397,828, a gain of 58 per cent over the corresponding month last year, when the total was $13,534,502, according to the machinery division of the department of commerce.

Power-driven metalworking machinery exports in November were valued at $5,988,511, an increase of 58 per cent over the $3,785,013 value in November, 1936. Other metalworking machinery exports were valued at $364,664, a gain of 46 per cent over the corresponding month last year. The largest gains in this group were in pneumatic and other portable tools.

Hope for Results From Roper Conference Jan. 19

■ In Washington last week it was reported on good authority that President Roosevelt will confer with the Roper business advisory council at its next regular meeting Jan. 19. It is possible some kind of agreement might grow out of the meeting for closer co-operation between business and the government. E. R. Stettinius Jr., chairman of the finance committee, United States Steel Corp., is a member of the council.

Secretary Roper told newsmen last week that a quick survey of year-end inventories made by experts of his department indicated a mixed situation with respect to raw materials in the heavy goods industry.

"Steel producers do not normally maintain large inventories," he said, "since they adjust production to consumer demand more closely than do most industries."

Republic Expanding Youngstown Properties

■ Youngstown's position as an iron and steel center will be greatly improved as a result of expansions being made by Republic Steel Corp.

Contracts have been let for replacing the No. 3 battery coke ovens and for increasing the capacity. The battery now consists of 61 ovens, which will be increased to 69. Capacity will be increased about 15 per cent to a total of 90,000 tons of coke per month. The new ovens will be ready about Sept. 15.

Equipment is being added and repairs are being made to the by-product plant.

Work has been started on demolishing one of the blast furnaces. This 500-ton unit will be replaced with a new furnace, having daily capacity of 825 tons. The shell and other equipment, however, will be constructed for an eventual capacity of 1000 tons. Foundations will be started March 1.

High Tensile Steel Gives Increased Capacity

■ **Capacity of this streamlined cab-over-engine tank truck was increased from 2600 to 2800 gallons by use of Yoloy, the Youngstown Sheet & Tube Co.'s nickel copper high tensile steel, without any increase in deadweight. Truck was built by Gar Wood Industries Inc. for the Texas Corp.**

Activities of Steel Users, Makers

■ LYON, Conklin & Co. Inc., Baltimore, manufacturer of metal products, presented veteran employes with service medals at a recent banquet. Oldest in point of service was Andrew Snyder, factory superintendent, 55 years with the firm, who received a gold and diamond button. The company was founded in 1860 by William L. Lyon. Edgar Lyon now is president and Robert H. Lyon is vice president.

♦

Tropic-Aire Inc., manufacturer of automobile and other heaters, has transferred all manufacturing activities from Minneapolis to its new plant in Chicago.

♦

Lafayette Steel Corp. has opened a warehouse at 4150 South Karlov avenue, Chicago, carrying a complete stock of tin plate and black plate.

♦

Theodore L. Dodd & Co., Chicago, has been appointed western sales representative for Mackenzie Walton Co., Pawtucket, R. I., manufacturer of seamless brass, copper and other alloy tubing.

Allen-Bradley Co., manufacturer of motor control equipment, has moved its Cincinnati office from 602 Cincinnati Terminal warehouse to newer and larger quarters at 2331 Reading road. W. L. Jaeckel is district manager.

♦

G. Brady & Co. Ltd., Pott street, Ancoats, Manchester, England, will establish a new factory in Plattsburg, N. Y., this month to manufacture steel roller shutters. The firm is reported to have received sufficient orders to keep the plant busy for three years.

♦

Mall Tool Co., maker of portable flexible shaft equipment, Chicago, has taken over the assets, manufacturing plant and equipment of Wappat Inc., Pittsburgh, and all future transactions regarding Wappat portable tools will be conducted in the name of the Mall company, either at Chicago or Pittsburgh.

♦

General Plate Co., a division of Metals & Controls Corp., Attleboro, Mass., has purchased the thermostatic metal, electrical contact and contact material business and good will of the Laminated Metals Corp., Providence, R. I. B. W. Dezotell, formerly manager of the thermostatic metals division for the latter company, is now associated with General Plate.

DEEP DRAWS present no Problems to OUR COLD ROLLED STRIP STEEL

THE business of American Quality Cold Rolled Strip Steel is to *solve* your fabricating problems for you, and to do it economically, too. That is why fabricators are switching from some of the more expensive metals to Cold Rolled Strip Steel. They have found this product will stand the most severe tests and will do the job for them at less cost.

Investigation will prove to you that Cold Rolled Strip Steel can be relied upon to make serviceable, dependable parts that are of light weight, have a smooth, shining finish, and are completely accurate in size. You will find this material is easily adapted to high speed continuous operations.

You can count upon American Quality Cold Rolled Strip Steel to give you the best results. It is made in the most complete range of widths finishes, edges and tempers, and its reputation for service has been built upon performance. We have assisted many manufacturers in planning the most economical application of Cold Rolled Strip Steel to their requirements and our representatives gladly offer this assistance to you.

U·S·S AMERICAN QUALITY COLD ROLLED STRIP STEEL

AMERICAN STEEL & WIRE COMPANY

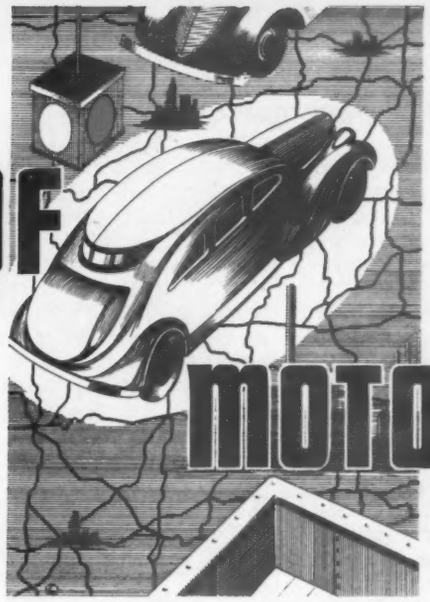
Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

MIRRORS OF MOTORDOM

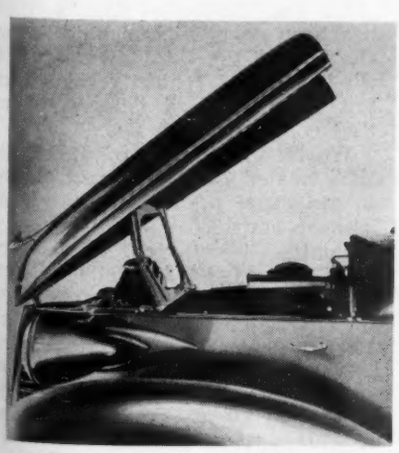


DETROIT

■ STAGING Hudson's announcement of its new 112 or low-price model was done with all the masterful touches of a Billy Rose; results, from a publicity standpoint, were probably all that could be hoped for, and then some.

First gun in the carefully planned campaign was the dispatching of 156-word telegrams to hundreds of editors and publishers throughout the country inviting them to attend a "meeting of more than usual significance and importance" in Detroit last Tuesday to hear details of "a program of definite action . . . in direct contradiction to adverse business news and action now emanating from so many sources." Publishers packed their bags.

Next was a series of "teaser" advertisements appearing in Sunday issues of leading newspapers announcing "a new car in the *lowest* price field." Only a postoffice box number gave any clue as to who was behind this announcement (although perhaps readers of the Dec. 13 issue of STEEL were able to supply the answer). According to Hudson officials, postoffice box 1221 in Detroit was clogged at every mail delivery starting last Monday morning with telegrams and letters flooding in from all parts of the country.



BY A. H. ALLEN
Detroit Editor, STEEL

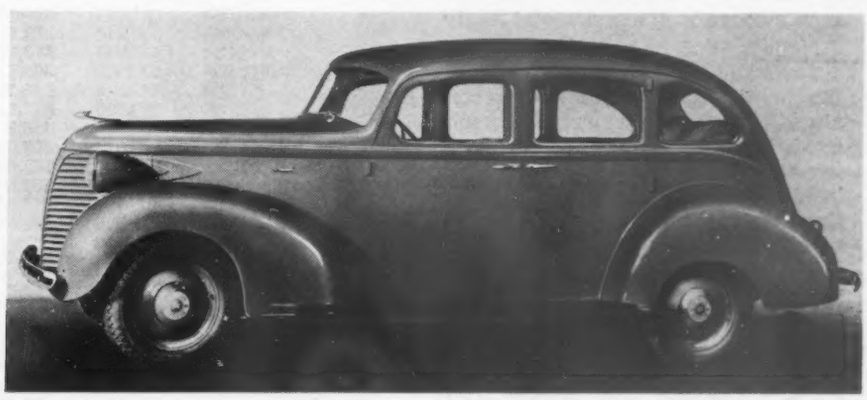
Telephone lines were buzzing here the same day, as many a business man attempted to ferret out details of the "blind" announcement.

The answer was not long in coming. On Tuesday A. E. Barit, Hudson's soft-spoken president, welcomed the 150 editors and publishers in the Book-Cadillac's Italian room and shortly declared, "Jobs for 6000 more Hudson workers are coming as soon as our production lines can absorb them. Full-time operation for our organization we estimate will consist of 12,000 men and women at that time, an increase of $1,250,000 in our monthly payroll. Also an additional estimated expenditure of approximately $11,000,000 for tools, production materials, transportation and other costs has come or is coming.

"If the automobile industry was able to lead the way out of the DEpression, it seems reasonable to expect it to do something about leading the way out of the REcession. The opportunity and the privilege of being the first to take definite action in the present situation falls to Hudson."

Later in the day newsmen traveled to the Masonic Temple to view the new Hudson 112. The unveiling was run off with all the dramatic flare of last fall's automobile previews.

Hudson's New Standard-Bearer in Low Price Field



■ INVADING the price field of the so-called "big three," Hudson last week unveiled this new Hudson 112, an 83-horsepower 6-cylinder, 112-inch wheelbase model now coming from assembly lines. Within two weeks Hudson hopes to rehire 6000 employes, bringing the working force to a full-time 12,000 basis. Changes in the Hudson 112 include an engine with shorter stroke, new fenders of reduced length, a new type of alligator hood raising from the rear. Springing is of the conventional semi-elliptic type, gearshift and transmission also are conventional. Bodies are unusually roomy for a car on this wheelbase

As shrouds were whipped back from the new models, the assembled guests broke out with a round of applause, and Hudson representatives anxiously awaited spectator reactions.

On Thursday and Friday the new model was shown to Hudson dealers and distributors. Showings will be held in all leading cities, and formal announcement will be made around Feb. 1. The company intends to back up the new car with a vigorous advertising campaign.

Actually the Hudson 112 has been in process of development for the past six months. On a 112-inch wheelbase, 5 inches shorter than the present Hudson Terraplane, the car is not a small car in the sense of the Willys or American Bantam. Bodies are practically duplicates of the present Terraplane bodies. New dies have been required by the shorter fenders. The hood is shorter and of a new type which lifts from the rear, being hinged by a strap at the front and supported by a folding stamped brack about midway between the front and rear.

Engine is 83-horsepower, compared with 95 for the Terraplane, reduction coming entirely through a shorter stroke. Early production will include four body types, two sedans and two coupes. Front-end appearance does not differ appreciably from the present Terraplane.

Priced With "Big Three"

In substance, what Hudson offers is a car priced directly in the Ford-Chevrolet-Plymouth field, about $130 below the present Terraplane figure. Price details were withheld until Sunday, possibly on the chance the "big three" might take steps toward reducing their prices in view of the new competition. However, such a move is not considered likely.

Hudson is to be congratulated for a favorable psychological effect on the public, for willingness to step ahead aggressively under present conditions, and for nicely timing the announcement. The news made headlines in probably every paper in the country; the President commented beamingly; Homer Martin of the UAW added his praise; and editorial writers poured out words of encouragement.

The rest is up to the car-buying public. Cars are now rolling from Hudson assembly lines, and to stock the 5000 Hudson outlets with four cars each would require a minimum of 20,000 cars. Under full steam, Hudson can turn out about 800 cars per day. Assuming three-fourths of such output will be the new 112, and assuming it will be possible to move four cars to every outlet, then for the next two months anyway Hudson workmen are assured of full-time jobs.

Questions still unanswered are these: How will the new 112 affect used car values of Hudson dealers? How will a less expensive model affect sales of the Terraplane, until now the lower-priced model? Is present curtailment in car buying explained by a public's belief that it is not getting enough car for its money?

■ THAT automobile manufacturers are becoming more acutely conscious of their dealers' problems appears more evident, and strong effort is being directed toward attempting to alleviate any disaffection which dealers may exhibit toward "the factory."

General Motors announced Thursday the formation of a "dealer relations board" with personnel including the four top-ranking executives of the corporation—Alfred P. Sloan Jr., W. S. Knudsen, Donaldson Brown and John Thomas Smith. The board will "provide an organized opportunity, through a definite operating procedure, whereby any dealer holding a selling franchise may obtain a judicial review of any administrative decision which, according to that dealer's belief, importantly affects his equitable rights."

Chrysler is also taking steps toward correcting any maladjustments among dealers, and for the first time in the corporation's history on Tuesday of this week will hold a combined meeting of 1000 regional and district sales managers, sales, parts and service representatives and other individuals engaged in contacting distributors and dealers. Purpose of this unprecedented assembly is threefold: first, to review general business conditions with the field organization; second, to discuss policies in reference to the sale of the corporation's products; and third, to discuss relations between the factory and dealers.

Beneath these vague generalities are considered to be some important steps which Chrysler proposes to take in connection with the first two of the above-mentioned purposes. While Chrysler President K. T. Keller says no new models or changes in prices are contemplated and the subject will not be discussed, look for some more of Hudson's "definite action" on the part of this aggressive automobile builder.

■ CHIEF harassment of dealers, as indicated by President Knudsen of GM in his announcement of the 30,000 layoffs made by the corporation in its plants last week, is the complete glutting of the used car market. Estimates indicate there are about 200,000 used cars in the hands of dealers above the normal level of 400,000. There are at least three plans which might be used to bring the market back to normal.

Selling a good share of these cars should not be an insurmountable task, if some intelligent direction is applied.

Speaking of layoffs, Mr. Knudsen's figures indicate General Motors now has on its payrolls about 205,000 employes, compared with the peak total of 270,000 for 1937. Those now at work are generally on a three-day 24-hour week schedule. The corporation will turn out an estimated 90,000 cars this month, compared with a normal production of 200,000.

On the matter of layoffs, there has been no publicized objection on the part of the UAW. Homer Martin has stated seniority regulations are being followed fairly well, and that complaints are few.

World production of Buick for 1937 totaled 233,923, largest volume in ten years and a 27 per cent increase over 1936.

Pontiac dealers in 1937 delivered 211,772 new and 393,700 used cars, eclipsing all records for this producer. Same figures for 1936 were 178,931 new and 327,842 used cars.

J. R. Davis, assistant Ford sales manager for the past ten years, has succeeded W. C. Cowling who recently resigned his post.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,698
March	447,894	438,943	519,177
April	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	456,909
Aug.	245,075	275,934	405,064
Sept.	92,728	139,820	175,620
Oct.	280,316	230,049	337,979
Nov.	408,550	405,799	376,637
11 mos.	3,701,494	4,097,316	4,669,629
Dec.	418,317	518,958	.....
Year	4,119,811	4,616,274	.....

Estimated by *Ward's Automotive Reports*

Week ended	
Dec. 11	85,765
Dec. 18	82,025
Dec. 25	67,230
Jan. 1	†49,550
Jan. 8	54,084

	Week ended Jan. 8	Jan. 1
General Motors	22,425	†19,325
Chrysler	2,750	. . . .
Ford	22,765	†23,715
All others	6,144	† 6,510

†Revised.

WINDOWS OF WASHINGTON

BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ CONFUSION has reigned here for a fortnight, due to the business recession and recriminations between those who are for and against big business.

Business representatives have charged the government has created the depression and administration officials have asserted that business is trying to liquidate the New Deal.

There is an interesting behind-the-scene story to the effect that Assistant Attorney General Jackson and Thomas G. Corcoran, of White House fame, got together recently and decided to take the raps for the President. There is no question the latter was on the spot on the recession. So they tried to draw a red herring across the trail and get off with both feet on the monopoly question. This, in itself, would split the ranks of members of congress who are working in concert against hours and wages and other legislation which the President wants.

Apparently the Jackson-Corcoran plan succeeded because it got everyone interested in business and monopolies. If the effort fails the President has not lost prestige and if it succeeds the President has everything to gain. The affair then was nothing but a trial balloon so that the President could see just where the country stands and there is no doubt his idea on monopolies at the opening of congress was based on what he considered the country's reactions were to the Jackson talks.

"Business Not All Bad"

While there are varying opinions regarding the President's speech to congress last week, the consensus seems to be that he was trying to conciliate business. If such was his idea it was predicted in this column in the issue of Dec. 27. At that time the writer was held by some of the President's advisers that such was his intention. Of course he did crack down on "the 10 per cent" recalcitrant business minority but he also snapped the whip at anyone, especially high in the government, who contended that all business is bad.

The Chief Executive indicated that later he will have some special messages for congress and there is no doubt one will ask for revisions of the antitrust laws. There is no secret about that. Also he will ask for more money for national defense but just what this will be has not yet been decided. Whatever it is, it will call for more steel.

JACKSON SPEECHES HAD WHITE HOUSE APPROVAL?

The antitrust speeches made by Mr. Jackson were followed by hot arguments between the "haves" and the "have nots" of the Roosevelt administration.

No one who knows anything about the present administration but is sure that the Jackson speeches had the White House approval. In fact the inside story here is that Mr. Corcoran, writer extraordinary to the President, wrote a large part of the speech. In addition, Jackson was on a fishing trip in Florida with the President not so long ago when there was a general discussion of the antitrust problem.

It will be recalled that Jackson blamed the recession on prices charged by so-called trusts and he gave more than a hint that there would be war on monopoly at this session of congress.

There is an interesting story in connection with the Jackson speech. He originally asked for 15 minutes from the radio network. The radio company asked business if it wanted 15 minutes to reply and the latter was preparing to make a reply at the same time, when Jackson asked for a half hour, having been tipped off that business wanted to answer. Only a half hour was available and so business was left holding the bag and got no chance to make reply.

However, the following night, General Hugh S. Johnson made answer over the radio in which he called Jackson about all the names even that an expert could think of and showed wherein Jackson was wrong.

At the same time William B. Warner, president of the National Association of Manufacturers, made reply in which he made a renewal of industry's offer of full co-operation to curb unemployment and end the business recession. He expressed the hope that his views and the expressed antipathy to business did not represent the views of the government towards the desire of manufacturers to help solve the nation's economic problems.

STEEL HAS MUCH AT STAKE BEFORE PRESENT CONGRESS

In addition to a number of specific bills before the present congress the steel industry will be much interested in a number of abstract matters, such as tax revision legislation, expansion of the national defense program, and anti-monopoly legislation, which seems to be assuming importance.

The Chief Executive has stated definitely that he will ask for hours and wages legislation. The labor unions are also asking for it, but in a different way. It seems impossible, however, unless the administration makes a deal with the southern Democrats, that any legislation can be passed along this line. Of course, there are always ways of doing such things and doubtless the administration will go to any length to attain its end. The President

feels strongly on this subject and has apparently made up his mind he is going to have his way.

Another thing likely to take up the attention of the new session is the American merchant marine. Considerable pressure is being brought to bear on that subject.

The merchant marine committee of the United States chamber of commerce has made a report in which it advocated support for changes in the merchant marine act of 1936, to make possible the upbuilding of the American merchant marine under private ownership and operation. James A. Farrell, former head of the United States Steel Corp., is chairman of the committee.

The Farrell committee regards as cardinal requirements for a successful merchant marine program a fair and consistent attitude of the government on the matter of subsidies, irrespective of changes at any time in the national administration; modifications in the law which will put American shipping lines on a parity with foreign competitors on essential trade routes; and government supervision that will not interfere with flexibility of operations.

ROPER ASSURES HONEST BUSINESS OF SAFETY

"Good business has nothing to fear from this administration," said Secretary of Commerce Roper at a recent press conference in which he was trying to gloss over some of the wild statements made by Mr. Jackson on the question of monopolies and business.

"Evil monopolies," said Roper, "that is, those which stifle competition among business interests, are quite a concern to good business itself, and the consumer is quite interested from the standpoint of undue increase in prices brought about through monopolistic control. In fact, such practices are obnoxious under our form of government, which we call a democracy. Such evil monopolies in the way I mentioned have no friends that I know of in this country, either in the political field, in the business or economic fields, because both major political parties have gone on record against them in their platforms. I repeat, good business has nothing to fear."

In connection with the present business recession the secretary was asked if any factors are now prevailing which are similar to those at the beginning of the recent depression. Mr. Roper said, "I should say fear is always the same. I do not believe, however, that fear has developed now to the extent it existed then, though fear is the outstanding factor."

Discussing further the question of monopolies, Secretary Roper said that "the true measure of business is the social and economic services rendered. When unfair monopolistic practices are engaged in and cannot be corrected through normal competitive procedure then the government must protect the rights of the public through regulatory agencies. The regulatory activities of the government are not therefore directed at mere size of the individual business unit, but at abuses.

"It must, of course, be recognized that large corporate units carry an increased social responsibility in the use of their natural power. But the fundamental criterion by which industrial units should be judged is the extent to which the public interest is served rather than form or size."

BUSINESS HAS TWO ADVOCATES AT COURT

High in the councils of the present administration are two men who are making every effort to work out something helpful to business.

Of course they have plenty of opposition but they also have considerable influence and may be able to stem the tide of anti-business legislation. They are no other than the President's son, James Roosevelt, secretary to the Chief Executive, and Donald Richberg, former head of NRA.

It is reported in innermost executive circles that young Roosevelt and Richberg, both of whom have the unbounded confidence of the President, are doing all in their power to swing the President from anti-industry to pro-industry.

SIX TRADE AGREEMENTS NOW UNDER NEGOTIATION

As the new year began Secretary of State Hull showed no decrease in his desire for new trade agreements. A number of them are now under way and in various stages of development.

A new agreement is under discussion now with the United Kingdom and an expanded one with Canada, with which country the United States now has an agreement.

Announcement has been made by the secretary also that he contemplates agreements with Venezuela and Turkey and intention to negotiate trade agreements has been made by the state department with both Ecuador and Czechoslovakia. This means that six new agreements are in various stages of negotiation.

CENSUS OF UNEMPLOYED SHOWS 10,000,000 IDLE

John D. Biggers, Detroit glass manufacturer who headed the unemployment census, has made a preliminary report to the President which shows that when the census was taken, Nov. 16-20, 1937, there were 7,822,912 unemployed persons.

Mr. Biggers stated that the enumerative test census which followed this voluntary registration, and which actually covered 1,950,000 persons by house-to-house canvas indicated that the voluntary census had been 72 per cent complete, so that allowance for this variation would give a projected maximum total of 10,870,000 who regarded themselves as unemployed, at the time of the census.

It is estimated here by government experts that about 1,000,000 persons who were employed when the census was taken are now unemployed.

EMPLOYES MAY BALLOT AGAINST REPRESENTATION

The election policy of the national labor relations board permitting workers to vote for either of two rival labor organizations or to record a negative vote against both has been reaffirmed in connection with the supplemental election of the Interlake Iron Corp., Chicago.

The board announced this ruling in which it denied the request of the SWOC that the words "or by neither" be removed from the ballot carrying names of SWOC and employe associated members.

TIN PLATE SCRAP EXPORT ALLOTMENTS ARE MADE

The state department last week announced that allotments totaling 6891 long tons of tin plate scrap have been assigned to 35 producers for export, subject to license, during 1938.

Applications for allotments totaling 24,449 tons were received, some of which were reduced in order to comply with the requirements in the rules of procedure.

The state department says that applications for license to export tin plate scrap may be submitted by any producer who has been assigned an allotment or by any person authorized by such producer to export tin plate scrap under his allotment.

Allotments totaling 23,847 long tons of tin plate scrap were assigned for export, subject to license, during 1937. One hundred and eight licenses were issued in 1937 authorizing the exportation of 16,608 long tons of the scrap valued at $333,187.50. All licenses issued during 1937 named Japan as the country of destination.

STEEL 10.51 PER CENT OF GOVERNMENT BUYING

During the last quarter of 1937, according to the labor department, 700 contracts were made by the government under the Walsh-Healey act for iron and steel and products totaling $34,029,011.77, which was 10.51 per cent of total government contracts made during that period.

Industry Must Become Articulate; Silence Harmful in Face of Criticism

ONE of the peculiar manifestations of the present day is the apparent inability of industry to reply effectively to its enemies. This is not because industrial leaders lack any realization of what is necessary to pave the way for renewed industrial activity in this country.

Nor is it due to a *laissez faire* attitude of passively waiting and trusting that things may get better in the future. Prominent industrial leaders in recent months have stated that the time has come for industry to enter politics, that the root of most of our present troubles, unemployment, is a problem for industry to solve, that the time has come for telling industry's story to the public.

"We do not believe in publicity," is a statement made frequently by industrial leaders in times past. Many years of adherence to this policy seem to have ingrained this attitude throughout industry. It is not strange, therefore, that industrial leaders now find it difficult effectively to combat the utterances and activities of specious politicians and rabble-rousers.

Sitdown Policy on Industrial Information Contrasts With Blatant Propaganda of Labor Leaders

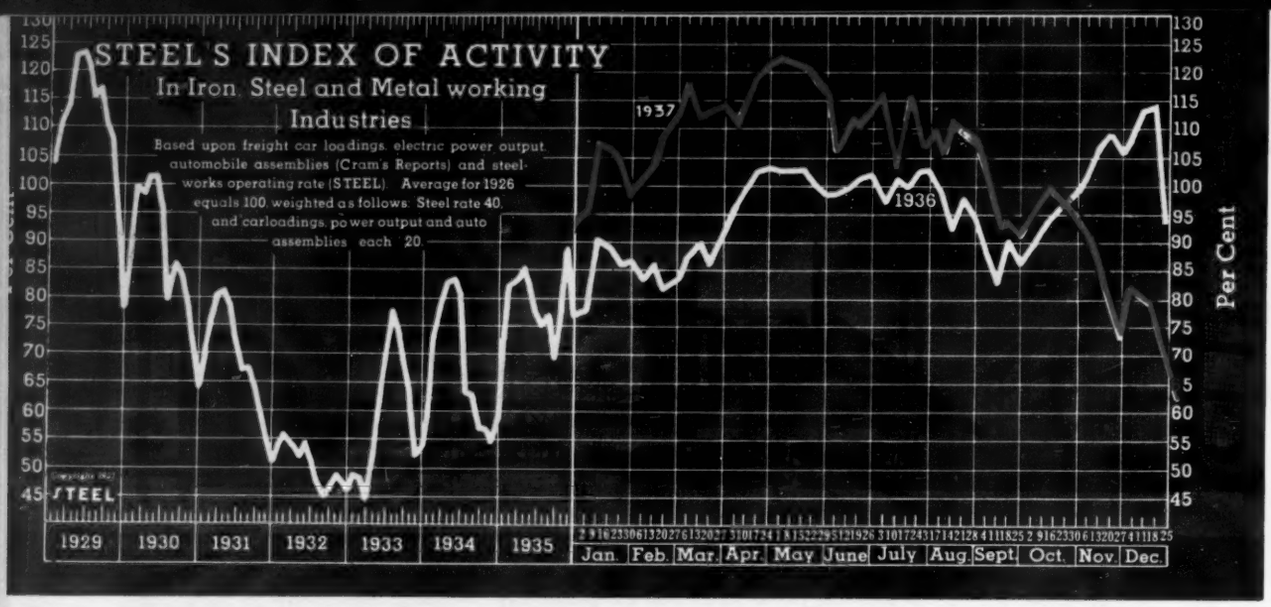
A case in point is the recent experience in connection with labor troubles. Newspaper reporters assigned to cover sit-down strikes and hungry for the facts involved found it difficult to get any facts whatever from the managements involved. Labor leaders, on the other hand, followed their traditional policy of being fully prepared to deal with the press. It is no accident, therefore, that the public has been much more fully informed about the side of organized labor than about that of the employers.

Right now the public is being taught that the present recession is due to a sit-down strike on the part of capital. Industry is being charged with monopoly and conspiracy at the expense of the general public. If pursued to its logical end, this campaign is almost certain to bring about nationalization of industry in some form or other. If the public generally accepts the impression that industrial managements refuse to co-operate to the general welfare, new curbs to industry definitely will be set up.

Business Leaders Should Use Same Energy in Creating Good Public Relations as in Making Sales

It is high time that the men who have brought industry to its present position in this country now take effective action in educating the general public along sound economic and political lines. It is simply a matter of organizing toward this end. Available for this work are many well trained relations experts. Available also for telling industry's story are the very same means now employed in persecuting industry.

It is time for industry to replace its present defense with a strong offense. The first objective should be the organization of local campaigns which will result in the election this year of members of congress and of state legislatures who understand clearly what industrial products and industrial payrolls mean to our general walfare.


STEEL'S INDEX OF ACTIVITY
In Iron, Steel and Metal working Industries
Based upon freight car loadings, electric power output, automobile assemblies (Cram's Reports) and steelworks operating rate (STEEL). Average for 1926 equals 100, weighted as follows: Steel rate 40, and carloadings, power output and auto assemblies each 20.
1937
1936
Per Cent
STEEL
1929 1930 1931 1932 1933 1934 1935
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

STEEL'S index of activity declined 7.1 points to 62.4 in the week ending Jan. 1:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
Oct. 30	95.7	99.1	86.4	55.0	52.3	48.4	59.2	72.5
Nov. 6	82.4	102.1	88.4	54.9	50.7	48.5	56.0	71.5
Nov. 13	86.5	107.9	88.8	55.2	52.6	47.7	55.5	73.0
Nov. 20	84.9	109.9	90.9	54.4	55.4	49.2	54.8	71.0
Nov. 27	72.7	105.2	86.0	51.9	49.7	47.5	54.4	66.9
Dec. 4	81.5	108.4	91.7	56.8	52.6	45.3	52.9	69.2
Dec. 11	80.5	113.9	91.8	60.6	56.0	46.6	53.1	68.2
Dec. 18	79.4	114.8	91.9	64.4	58.0	46.9	52.3	67.3
Dec. 25	69.5	93.3	77.3	60.8	53.7	42.9	46.8	52.3
	1938	1937	1936	1935	1934	1933	1932	1931
Jan. 1	62.4*	96.6	78.2	65.4	53.6	45.3	48.8	58.5

*Preliminary.

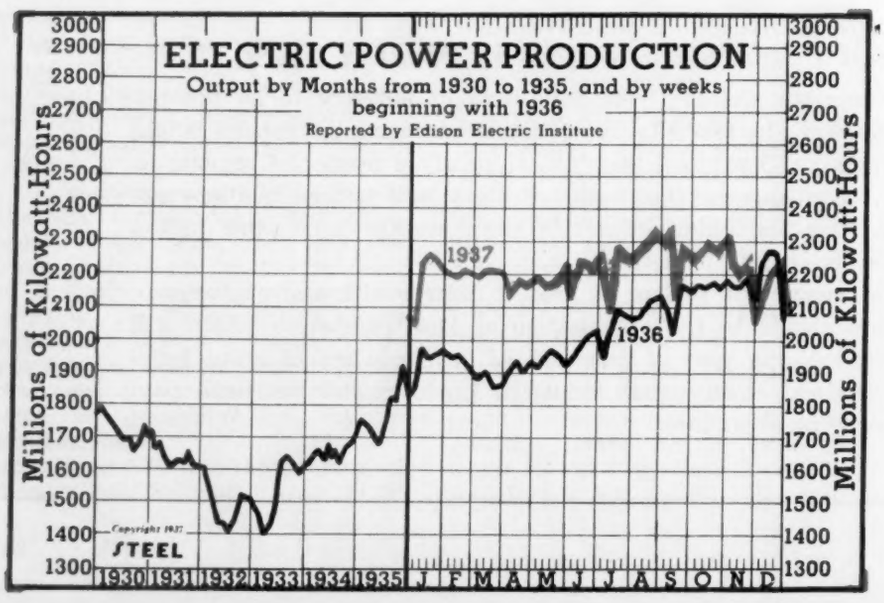
Activity Index Hovers Around 1934 Levels

HOLIDAY interruptions are accentuated in the records of business for the weeks of the year-end. STEEL'S index of industrial activity, which stood at 79.4 for the week ending Dec. 18 (the last week of 1937 unaffected by the holidays), slumped to 69.5 in the week ending Dec. 25, and eased further to 62.4 in the week ending Jan. 1.

In order to match this latter figure, it is necessary to go back to December, 1934. In that year the index for the week ending Dec. 29 was 60.8. For the week ending Jan. 5, 1935, it stood at 65.4.

The extremely low figure for the week ending Jan. 1, 1938, reflects dullness in all four of the barometers upon which the index is based. The heavily weighted rate of steelworks operations was down to 21 per cent of capacity. Automobile production was off to 49,550 units. Car loadings declined to about 435,000 cars, the lowest since the last week of 1934. Electric power output—alone of the four—remained at a level comparing somewhat favorably with recent year-end averages.

Obviously the rebound from holiday lows will be watched with more than usual interest for signs of recovery. At the moment, indications point to a moderate gain in the week ending Jan. 8

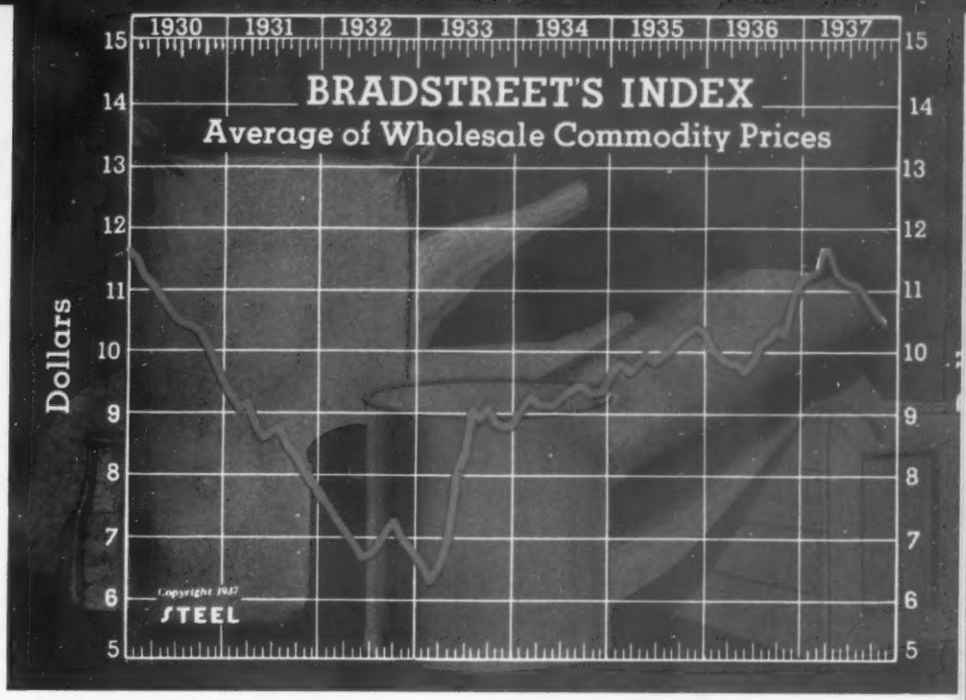

ELECTRIC POWER PRODUCTION
Output by Months from 1930 to 1935, and by weeks beginning with 1936
Reported by Edison Electric Institute
Millions of Kilowatt-Hours
1937
1936
STEEL
1930 1931 1932 1933 1934 1935
J F M A M J J A S O N D

	1937	1936	1935	1934
Dec. 25	2085	2080	1847	1650
Dec. 18	2202	2274	2002	1787
Dec. 11	2196	2278	1983	1767
Dec. 4	2152	2243	1969	1743
Nov. 27	2065	2133	1876	1683
Nov. 20	2224	2196	1953	1705
Nov. 13	2176	2169	1938	1691
Nov. 6	2202	2169	1913	1675
Oct. 30	2254	2175	1897	1669
Oct. 23	2281	2166	1895	1677
Oct. 16	2276	2170	1863	1667

BUSINESS TREND

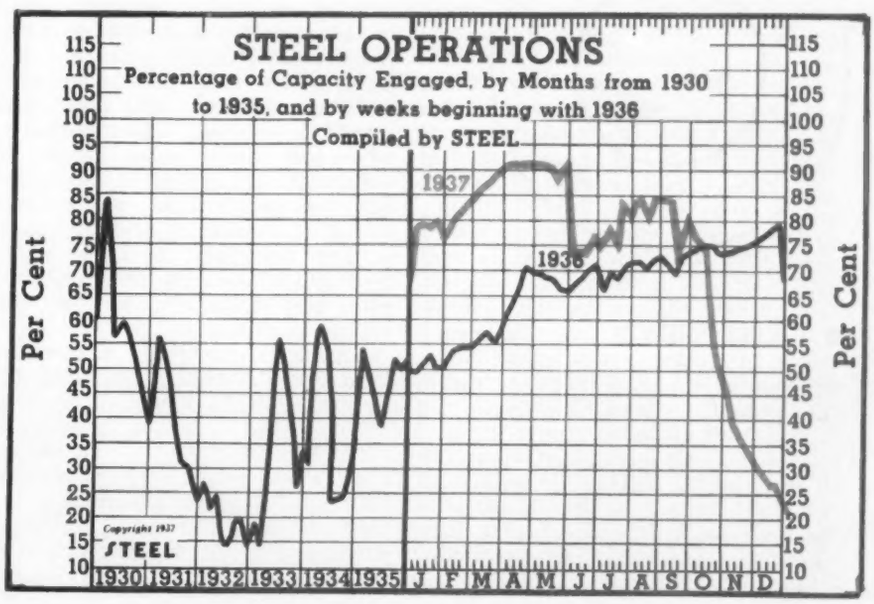
Commodity Price Index Shows Slight Loss on Nov. 1

	1937	1936	1935	1934
Jan. 1.....	$11.13	$10.36	$9.49	$9.01
Feb. 1.....	11.23	10.02	9.78	9.26
Mar. 1.....	11.34	9.92	9.79	9.17
Apr. 1.....	11.81	9.85	9.66	9.16
May 1.....	11.51	9.81	9.79	9.14
June 1.....	11.33	9.73	9.90	9.24
July 1.....	11.27	9.85	9.84	9.32
Aug. 1.....	11.19	10.14	9.91	8.48
Sept. 1.....	10.96	10.19	10.00	9.45
Oct. 1.....	10.85	10.27	10.17	9.27
Nov. 1.....	10.35	10.22	10.28	9.29
Dec. 1.....	....	10.78	10.40	9.49


1930 1931 1932 1933 1934 1935 1936 1937
BRADSTREET'S INDEX
Average of Wholesale Commodity Prices
Dollars
15 14 13 12 11 10 9 8 7 6 5
Copyright 1937
STEEL

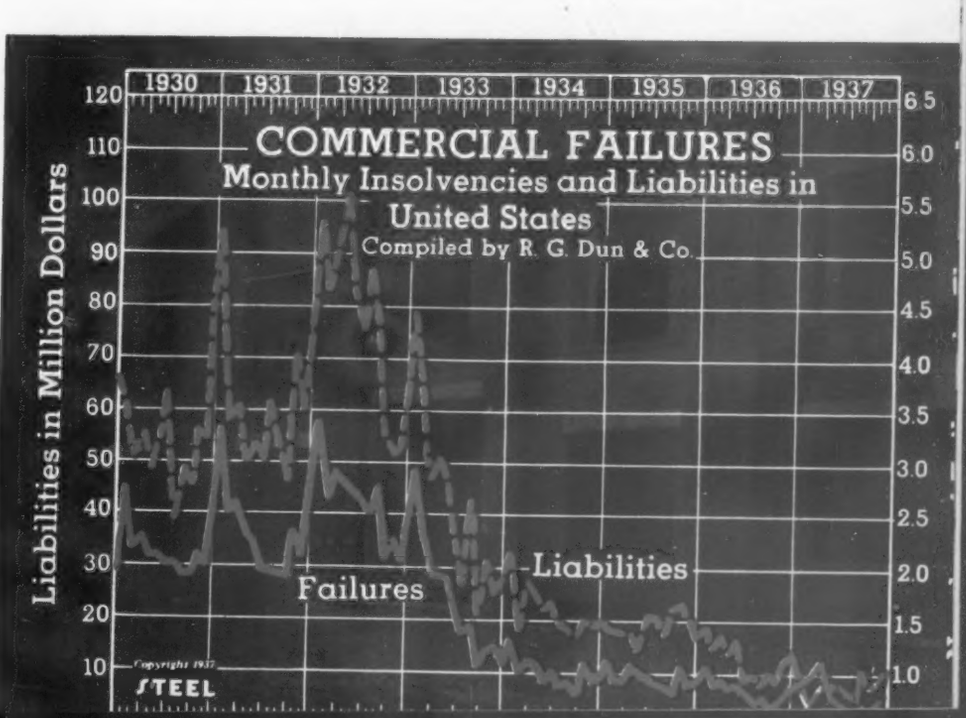
Steel Operations Continue Sharp Decline From Sept. 18

	Per Cent		
	1937	1936	1935
Jan. 1	21	79	49.5
Dec. 25	23	68	48.0
Dec. 18	27	79.5	52.0
Dec. 11	27	77.5	54.5
Dec. 4	30.5	76.5	57.0
Nov. 27	31.5	75.5	56.0
Nov. 20	35	74.5	54.5
Nov. 13	39	74	52
Nov. 6	47	73	53
Oct. 30	51	73	54.5
Oct. 23	53	73	52.5


STEEL OPERATIONS
Percentage of Capacity Engaged, by Months from 1930 to 1935, and by weeks beginning with 1936
Compiled by STEEL
1937
1936
Per Cent
115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10
Copyright 1937
STEEL
1930 1931 1932 1933 1934 1935 J F M A M J J A S O N D

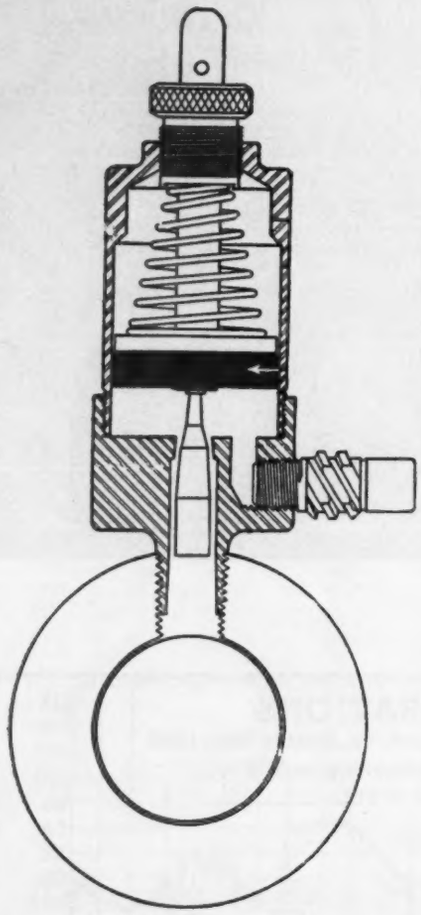
Commercial Failures Increase in November

	Failures, Number		Liabilities, Dollars (000 omitted)	
	1937	1936	1937	1936
Jan.....	811	1,077	$8,661	$18,104
Feb.....	721	856	9,771	14,089
March...	820	946	10,922	16,271
April....	786	830	8,906	14,157
May	834	832	8,364	15,375
June ...	670	773	8,191	9,177
July	618	639	7,766	9,904
Aug.....	707	655	11,916	8,271
Sept.....	564	586	8,393	9,819
Oct.....	768	611	9,335	8,266
Nov.....	786	688	10,078	11,532
Dec.		692	.....	12,288


1930 1931 1932 1933 1934 1935 1936 1937
COMMERCIAL FAILURES
Monthly Insolvencies and Liabilities in United States
Compiled by R. G. Dun & Co.
Liabilities in Million Dollars
120 110 100 90 80 70 60 50 40 30 20 10
6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0
Liabilities
Failures
Copyright 1937
STEEL

PROPERTIES AND US

BY S. BALLARD
Supervising Industrial Engineer, Tide Water Associated Oil Co., New York



The spring compression grease cup is low in price, efficient on small individually lubricated bearings

■ DEVELOPMENTS and improvements in grease manufacture and methods of grease application during the past few years have resulted in this lubricant attaining its rightful place as an equal partner with oil in reducing friction and wear of machine parts. Although oil is the most desirable lubricant to use when bearing design, operating conditions and method of application of the lubricant permit full film lubrication, nevertheless, there are numerous instances where grease will give better results at a lower cost.

Lubricating oils are more fully understood than greases, probably because their characteristics are more easily defined in terms which permit ready visualization of the properties involved and how these properties affect performance and field of service. Greases, on the other hand, not only contain oil, but also thickening agents and in many cases, fillers and addition agents incorporated to impart special properties, and the final characteristics depend upon both the ingredients used and the method of manufacture. By utilizing the same ingredients and proportions, but by changing the temperature, rate of heating and rate of cooling of the grease during the manufacturing process, lubricants of widely varying characteristics may be obtained.

The attainment of efficient lubrication is dependent upon the ability of the operators and designers of mechanical equipment to select the type of lubricant and method of application most suitable for the operating conditions involved. This in turn demands a knowledge of the properties of each type of lubricant, where each should be used for best results and how each should be applied. The question of when and where to use grease for industrial applications is important, but the problem is not entirely solved if grease is selected, as it is then necessary to decide which type and consistency of grease will give best results under the prevailing conditions.

Grease is essentially a combination of oil and soap, in which the purpose of the soap is to serve as a thickening agent to provide the desired consistency and to impart special properties, such as melting point and texture, peculiar to the type of soap used. Lubricating greases have an important field of service and their characteristics make them specially suitable for the following conditions:

1. Heavy duty, slow speed bearings.
2. Bearings operating in a dusty or dirty atmosphere where the grease aids in forming a protective seal against the entrance of abrasive impurities.
3. Bearings that are not easily accessible for frequent oiling and which, for this reason, are apt to be neglected by oilers.
4. Machines and manufacturing processes where it is essential that the lubricant does not drip or splatter from bearings onto the product being manufactured.
5. Bearings for which oiling devices are not applicable and where hand oiling is wasteful.
6. Antifriction bearings which are not sufficiently tight to hold oil without leakage.
7. Antifriction bearings operating in the presence of water where oil is not desirable, because it would float on top of any water that gained access to the bearing, thus depriving portions of the rolling elements and their races of lubricant. Free water also tends to cause corrosion, which is one of the greatest enemies of antifriction bearings.
8. Bearings subjected to high temperatures and where the bearing construction is such that oil thinned down by heat would escape before serving its purpose as a lubricant.

Users of greases are not so much interested in how these lubricants are manufactured as they are in the properties possessed by various types, and how these properties may be best utilized in reducing friction and abrasion between rubbing surfaces. In selecting a grease for any specific service, the consistency, melting point, stability, texture, solubility in water and load carrying capacity must all be considered in relationship to the bearing operating conditions and method of application.

Soften When Agitated

Consistency, or resistance to plastic flow, is one of the most elusive properties to evaluate because greases tend to soften when agitated. Thus a grease which is plastic when received in the drum may become semifluid when pumped through a grease gun or subjected to agitation in an antifriction bearing. This characteristic is recognized in the American Society for Testing Materials grease penetration test in which provision is made for determining both the unworked penetration of the grease as it comes in the drum, and the worked penetration which is measured after the grease has been agitated under definitely prescribed conditions. Many marketers and users of greases prefer to control and judge the consistency of a grease by its unworked penetration, whereas others standardize on the worked penetration. Regardless of the differences in opinion on this subject, both tests are of importance in evaluat-

ND USES OF

.. Lubricating Greases

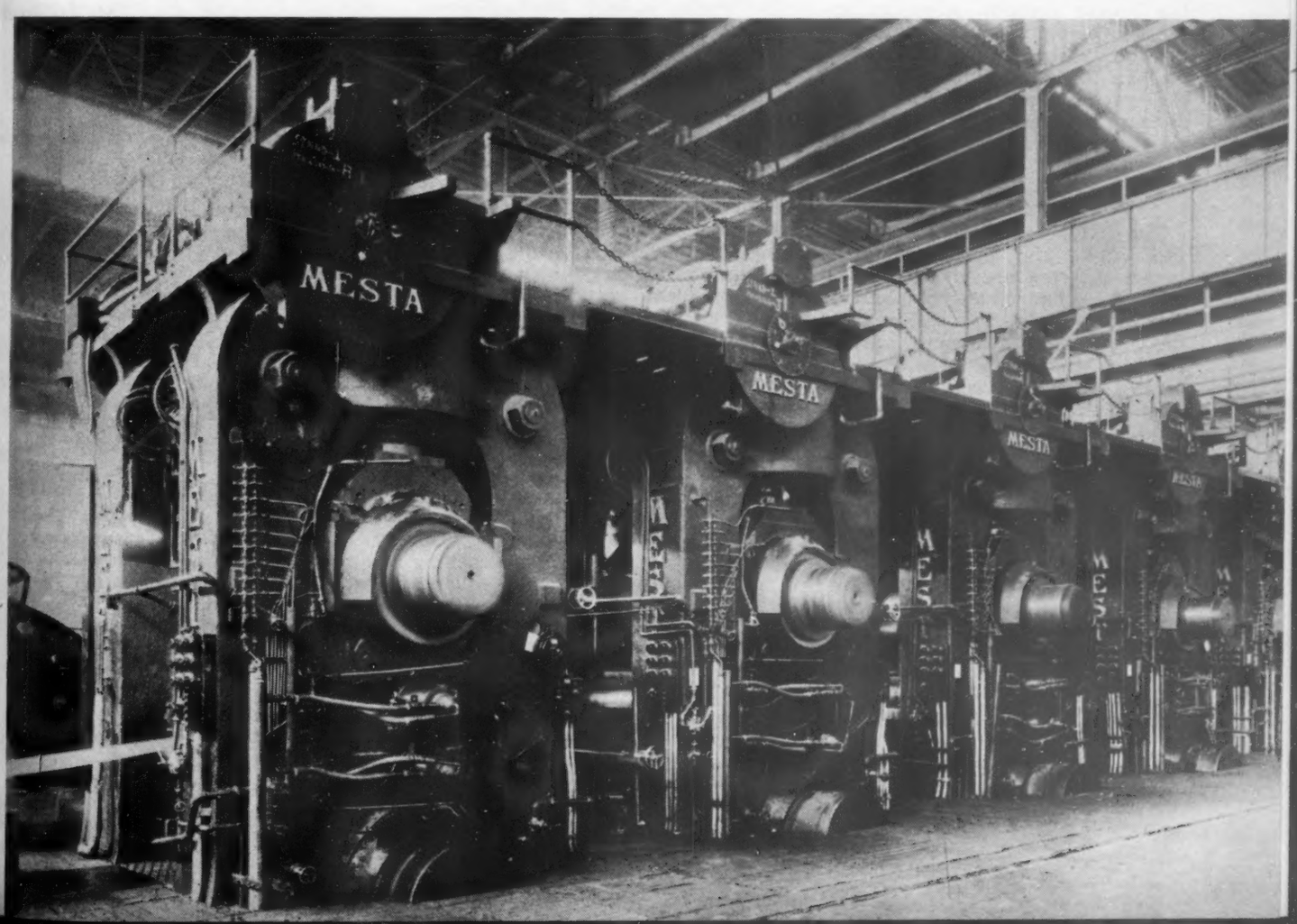
ing greases as the unworked penetration determines the ease with which the grease may be applied by the prevailing method of application and the worked penetration determines the consistency and the ability of the lubricant to resist leakage when subjected to agitation within the bearing.

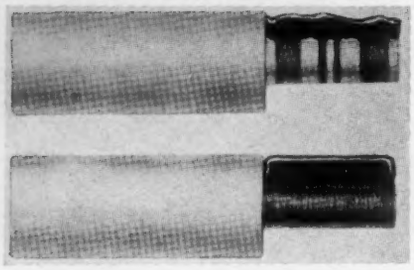
The standard temperature for determining the penetration of a grease is 77 degrees Fahr. However, for greases applied by high pressure systems or used in bearings subjected to low temperatures, in winter, the penetration test at 77 degrees Fahr. does not indicate the consistency at low-temperatures, as it is possible for two greases to have the same A.S.T.M. penetration at 77 degrees Fahr., but differ widely in their ability to be pumped at lower temperatures. The effect of temperature changes on the consistency of a high pressure grease is shown in the curves in which flow of the grease at various temperatures is plotted against pressure. The data on which these curves are based were determined by measuring the quantity of grease in milligrams per second feeding through 20 feet of ¼-inch pipe immersed in a bath at the test temperature when subjected to various pressures. It will be noted that lowering the temperature results in a material decrease in the fluidity of the grease. These data apply only to the grease tested, which was a soft grease made with a low pour, medium viscosity oil, and other greases might differ widely in their fluidity-temperature characteristics.

Melting point is of importance when greases are subjected to high temperature and this characteristic of greases is controlled by the type of soap used. Calcium soap greases melt at approximately 200 degrees Fahr., whereas sodium soap greases generally have melting points in excess of 300 degrees Fahr. Obviously, the melting point of a grease should be above the temperature to which it is subjected in service.

Stability of a grease, or its resistance to changes in properties during storage or use, is important for antifriction and other bearings in which one charge of grease must remain in service over a long period of time. There have been instances where antifriction bearings on electric motors, which had been in storage for a few months, were frozen because the grease had

Modern 4-high continuous mill equipped for pressure grease lubrication





Illustrations show necessity for having block greases in full contact with journals for efficient lubrication

oxidized during the storage period, forming gummy compounds which caused the bearings to stick. The mineral oil used has an important bearing on the stability of a grease and such lubricants for antifriction bearings should be made with a good quality oil and be well made so there is no excess alkaline or acid reaction.

The resistance of a grease to water is determined by the type of soap used, as some soaps are insoluble in water, whereas others emulsify easily. There is much misunderstanding on this subject as it is common belief that calcium soap greases, which are insoluble in water, will not emulsify when severely agitated with moisture. When water and a calcium soap grease are subjected to the milling action of an antifriction bearing the two become intimately mixed and the grease actually holds an appreciable quantity of water in suspension. However, this is purely a mechanical mixture in contrast with the reaction between water and a sodium soap grease in which the water actually dissolves part of the grease.

Other Factors Involved

The influence of the mineral oil used upon the properties of a grease is often not given the consideration that it deserves. It is common practice to consider only the consistency and type of soap in selecting greases for high temperature or heavy duty service with the result that the grease used for such conditions often contains the same low viscosity mineral oil incorporated in a soft grease applicable for medium pressures and low temperatures and differs only from such a grease by being made harder through the use of a greater soap content. When oil is used for heavy duty bearings or for high temperature service it is necessary to use an oil of heavy body to obtain efficient lubrication. Because oil supplies practically all of the lubricating value in conventional greases it is obvious that in order to obtain best results the same practice should be followed in the case of the grease. In other words, instead of adapting a grease for severe service conditions by increasing the soap content it is more effective to increase the viscosity of the mineral oil and thereby obtain greater load carrying capacity.

Greases are generally classified according to the type of soap used as a thickening agent, such as calcium and sodium soap greases, or according to some other distinguishing characteristic, such as graphite, block, extreme pressure or double base greases. Each type has characteristics making it specially suitable for specific service conditions, and a knowledge of the properties of each type is necessary for intelligent selections or recommendations of greases.

Calcium Type Analyzed

Calcium soap greases or lime soap greases as they are also known, are made with a soap formed by the saponification of slaked lime and a suitable fat to which mineral is added in suitable proportions to obtain the desired consistency. Water is necessary to stabilize this grease and prevent separation of oil and soap, and from one-half to about two per cent of moisture is generally present. Calcium soap greases are the most commonly used greases as all so-called "cup greases" and most greases for high pressure applications are made with this kind of soap. They may be obtained in consistencies ranging from fluid lubricants to hard block greases, and made with mineral oils of any desired viscosity.

Calcium soap greases are smooth in structure, impervious to water and have melting points of approximately 200 degrees Fahr. They are primarily suitable for plain or antifriction bearings operating at moderate temperatures and speeds, or where a lubricant capable of resisting the washing action of water is necessary. Their smooth structure makes them particularly suitable for high pressure greasing systems where the lubricant must be forced through long lengths of piping from pump to bearings. The moisture necessary to hold the oil and soap together plays an important part in limiting the uses of calcium soap greases, as once this moisture is evaporated separation of oil and soap occurs. Therefore, greases of this type should not be subjected to temperatures above their melting point as once melted they will not regain their original state. Severe agitation at temperatures in excess of 175 degrees Fahr. also tends to cause separation and, in general, best results will be obtained by confining the use of this type of grease to bearings operating below this temperature.

Sodium soap greases are made with a soap formed by the saponification of sodium hydroxide and fat. Moisture is not necessary for holding the soap and the mineral oil together and this type of grease is not readily broken down by reasonably high temperatures. Sodium soap greases are fibrous in structure, have relatively high melting points, generally in excess of 300 degrees Fahr., and are slightly soluble in water. Their best field of service is for plain or anti-friction bearings operating at moderate or high temperatures and where the grease is subjected to severe agitation. As they are not easily broken down by agitation or temperature they are very suitable, when of the right consistency, for enclosed gears where the housings are not sufficiently tight to hold a straight oil. Because of the fact that sodium soap greases are slightly soluble in water they are not efficient for bearings subjected to the washing action of considerable quantities of water.

Double Base Greases

Double base, or mixed base, greases are lubricants in which two soaps are used in order to provide some of the characteristics of each type. Most such greases on the market today contain a mixture of calcium and sodium soaps with the latter present in the greater proportion. Double base greases made with calcium and sodium soaps have some of the characteristics of each type of soap, as they are smoother in structure and have lower melting points than straight sodium greases but do not separate as easily as calcium soap greases when agitated and subjected to heat. These properties make greases of this type very suitable for high speed antifriction bearings for which service they are extensively used.

Cold set greases are made from mineral oil, rosin oil, water and hydrated lime and when the ingredients are properly mixed cold the grease sets in the container without the necessity of heat. These products are also known as axle greases and constitute the cheaper grades of greases suitable for rough bearings, open gears and skids. Cold set greases are insoluble in water and when used for gear lubrication usually contain graphite or talc.

Aluminum soap greases contain an aluminum soap which results in very stringy, transparent lubricants which resist splattering. They are water repellent and their non-splattering characteristic makes them suitable for application where a lubricant that will not readily drip or be thrown off is desired. Most commercial grades are of soft consistency for pressure gun application and are used primarily for

automobile chassis parts and aircraft engine rocker arms, and to a lesser extent for industrial machinery. By the use of rubber latex greases very similar in characteristics to aluminum soap greases and suitable for the same general applications can be made.

Graphite greases may be made by the addition of graphite to any kind of grease, but the great majority of such lubricants are composed of calcium soap greases containing up to 25 per cent of this material. This type of grease is especially suitable for rough, heavy duty bearings, particularly those operating under severe shock load conditions, and is extensively used in steel mills for lubricating plain roll neck bearings, either for hand packing or pressure application. For such work graphite serves primarily to fill up the pores in the metal, and thereby provide smoother opposing frictional surfaces, and as distance spacers preventing metallic contact when the bearings are subjected to shock load. In addition to these two functions, the graphite also makes the grease more resistant to the washing action of water.

Types Of Graphite

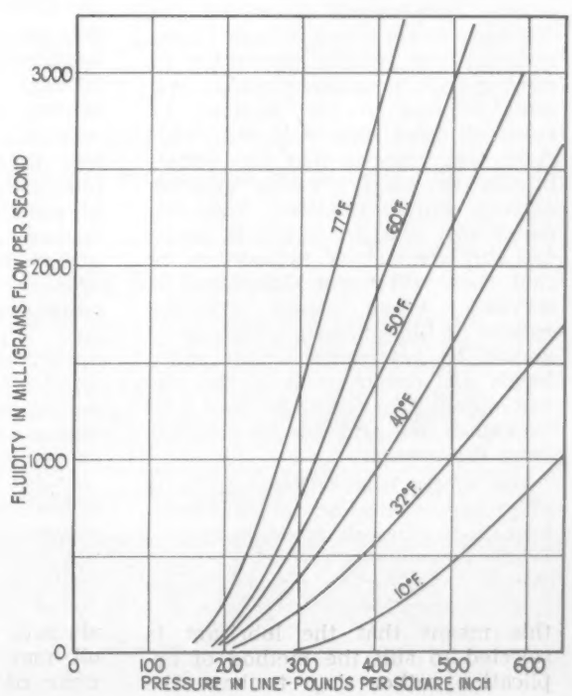
Both natural and electric furnace graphite are used in lubricating greases, the former type both in the flake and powdered, or amorphous, form. Flake graphite is primarily suitable for roughly machined, heavy duty bearings, but for general use powdered graphite is preferable. Natural graphites contain non-combustible mineral matter, sometimes as much as 20 per cent, which has mild lapping properties and which is left as ash when the graphite is burned. For roll neck and other heavy duty service, the presence of some mineral matter in graphite is not objectionable as it serves to lap in the rough surfaces of the bearings and provide smoother frictional surfaces. However, for best results the ash content of such graphite should not exceed 10 per cent, as any excess will cause greater wear as a result of the lapping action. The question of whether graphite greases are necessary or desirable for antifriction or finely machined, high speed plain bearings is controversial, but if, for any reasons, it is desired to use a lubricant containing graphite for such services, the graphite should be of the deflocculated, electric furnace type, which does not contain silicious impurities.

"Extreme pressure" greases are being used to an ever increasing extent for bearings subjected to high unit pressures, and present indications are that their use will be more widespread in the future. The majority of such lubricants on the market today for industrial uses are composed of calcium soap greases and either sulphurized fatty oils, lead soaps, combinations of the two or chlorinated bases. As extreme pressure lubricants depend for their action on either chemical action or deposition of a film on the metal and become effective only when conventional film lubrication fails, it is obvious that they are more chemically active than conventional lubricants. For this reason care should be exercised when selecting extreme pressure greases for industrial applications that the product adopted will not have any harmful corrosive action on the metals with which it will come in contact. Sulphur compounds present in some extreme pressure lubricants have a decided tarnishing effect on brass and bronze and when these metals are involved a sulphurized lubricant which is known not to be corrosive to copper and its alloys should be used. In general extreme pressure lubricants recommended for industrial applications are not as highly compounded as those used for automotive hypoid gear lubrication, and little or no difficulties with corrosive or other objectionable properties should be experienced when purchasing from reputable marketers.

Extreme pressure greases have found their widest application in steel mills in the lubrication of roll neck bearings of the antifriction type. Although such bearings do not require extreme pressure lubricants for the normal rolling elements, there is friction between the rollers and their retainers or cages requiring lubrication. Also, the inner races of antifriction bearings used for roll neck service are not generally a tight fit or keyed to the neck and in operation the races slip on the necks with the result that there is friction between the ends of the races and their opposing thrust surfaces. When such bearings are subjected to considerable thrust loads the lubrication problem involved is that of lubricating plain surfaces in contact under very high pressures and extreme pressure lubricants are essential to prevent rapid wear and high frictional heat.

Much of the effectiveness of grease lubrication is determined by the method of application to parts requiring lubrication. Some devices for applying grease are limited in the types and consistencies they will handle and, therefore, grease feeding devices should be selected that will efficiently handle the type of grease known to be most suitable for the bearings involved. Greasing devices and systems that are so designed that they will handle only one brand or one type of grease should be avoided as they might prevent the use of a subsequently developed grease which may be far more suitable for the bearings, but which cannot be used in the installed greasing system. Any attempt to select greases primarily to suit the method of grease application without due consideration of bearing requirements defeats the purpose for which lubricants are intended.

As the continuous application of lubricant under pressure at the lowest rate necessary to assure satisfactory lubrication is more economical and efficient than hand packing or by devices which are manually operated, it is desirable



Curves show effects of changes in temperature on grease consistency

to use this method wherever practicable. This does not mean that expensive centralized pressure systems are best for all requirements, as the spring compression grease cup is low in price and very efficient on small individually lubricated bearings. However, it is in the field of centralized pressure lubrication that the greatest progress has been made in application of greases to heavy duty equipment in steel mills and other heavy industries.

The use of centralized pressure greasing systems with definite control of the rate of application has resulted in a material improvement in lubrication of plain roll neck bearings in comparison with hand packing. One of the advantages of pressure lubrication is that it permits the use of grease of greater lubricating value than possible in block greases necessary for hand packing, as the latter must contain relatively high percentages of soap in order to secure the necessary hardness to prevent excess consumption. As oil is the primary lubricating medium in a grease, any modification which permits the use of more oil of suitable viscosity and less soap will result in greater lubricating value.

Soap Deposits

When grease is applied by spring compression cups it is under continuous pressure and since such cups are usually adjacent to the bearings and often subjected to radiated heat, there is a tendency for calcium soap greases to separate, forming soap deposits which interfere with or stop the flow of lubricant. Sodium soap or double base greases will usually give best results in these cups, particularly if the temperature to which the lubricant is subjected is high. Also, ordinary cup greases should not be used in high pressure greasing systems because of the tendency to separate into soap and oil. Calcium soap greases that are recommended for these greasing systems usually contain relatively high viscosity oils and are specially made for this method of application so that they will resist separation in service. When using graphite grease in high pressure systems it should be remembered that sharp bends and constrictions in the piping should be avoided as they tend to cause the graphite to separate from the grease.

One of the least efficient methods of grease application to plain bearings is hand packing as it is generally necessary to use a hard block grease in order to prevent excessive consumption of the grease, and this means that the lubricant is selected to suit the method of application rather than to have the most desirable lubricating properties. Although the rotating journal will wipe off some of the grease with which it is in contact, it is generally necessary for the journal temperature to be sufficiently high to melt the grease in order to have a sufficient quantity between the frictional surfaces to assure lubrication. This method is, therefore, more suitable for bearings operating at high temperatures or subjected to heat from an outside source than for bearings which normally run at temperatures only slightly above that of the surrounding air.

Use of Soft Grease

Large open top grease packed bearings which are not subjected to excessive heat will usually operate with lower frictional temperature rise and with less wear if a soft grease made with a heavy oil is used rather than a block grease. However, in order to use a soft grease on such bearings it is necessary to provide seals at the bearing ends to prevent excessive loss of the lubricant at these points. Simple rope or felt seals properly held in place will be satisfactory, but good results have been obtained on large bearings by using a hard grease at the bearing ends to form a seal with a softer grease in between to provide the necessary lubrication. Where it is not possible to seal the bearing ends sufficiently to prevent excess consumption of a relatively soft grease, improved results with block greases can often be obtained by punching holes in the grease and applying oil or a semifluid grease through these openings.

The most important point to remember in application of grease or oil is that only the lubricant that gets between the frictional surfaces is effective and all excess over that actually required for lubrication or bearing sealing is wasted.

Grease requires more care in storage than oil as unusually high temperatures may cause separation of soap and oil, particularly with calcium soap greases. Therefore, grease drums should not be stored adjacent to steam pipes as the resultant overheating may be harmful. Also drums that have been opened should be kept covered at all times when grease is being removed in order to prevent contamination with atmospheric dust, which in many types of industrial plants contains abrasive particles. These impurities are more harmful in grease than in oil as the former is not liquid and solid matter cannot settle out as with oil. If these atmospheric impurities are of an abrasive nature their mixture with oil may result in excess rate of wear of bearings. For the same reason any pails or small containers used to carry grease from the drums to various parts of the plant should be provided with covers.

Even though the most suitable grease and method of application for the operating conditions are in use, maximum lubrication efficiency cannot be obtained unless the bearings are correctly designed and grooved. For best results sleeve bearings should have the lubricant applied on the side ahead of the pressure area and a longitudinal groove at the point of application should be provided to assure good distribution along the journal. With the correct type and consistency of grease applied by an efficient method of application to a correctly designed and grooved bearing friction and wear will be reduced to a minimum.

Association Announces Silver Jubilee Meeting

■ Basic lessons learned during the last 25 years and a report upon the possible significance of these lessons to the gas industry in the future will be considered at the silver jubilee meeting of Compressed Gas Manufacturers' association, New York. The meeting will be held at the Waldorf Astoria, New York, January 17 and 18.

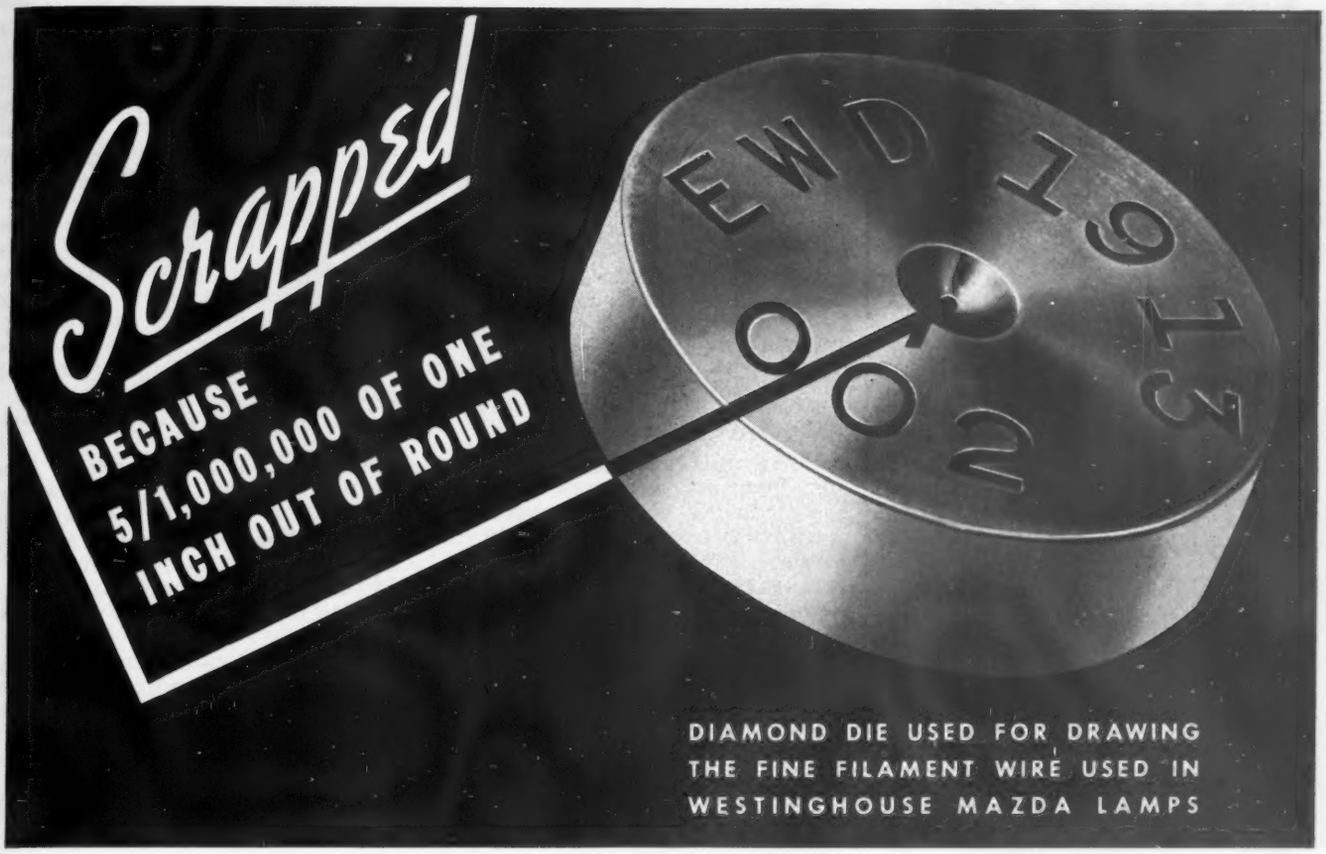
For a quarter of a century, the association has been active in handling problems of technical nature and matters involving safety for the benefit of many industries. Although the formal program has not yet been announced, interesting discussions are anticipated embodying technical and safety trends of various gases.

The secretary of the association, Franklin R. Fetherston, may be reached at association headquarters, 11 West Forty-second street, New York.

Iron and Steel for Farm Units Is Discussed

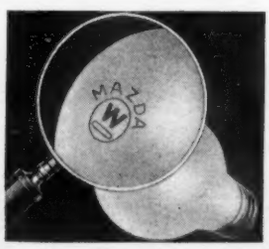
■ Two publications embodying information on service requirements of important agricultural equipment have been recently issued by International Nickel Co., 67 Wall street, New York. These publications which are now available also furnish interesting data on the properties of nickel alloy steels and nickel cast irons now widely employed in various farm machinery.

One publication, entitled "Nickel Steels Used in Producing Tractors and Implements," deals with the fundamental metallurgical aspects of farm equipment. The other publication is entitled "Implements and Tractors Use Alloy Cast Irons".



An example of Westinghouse Mazda Lamp Precision— to give you MORE LIGHT—LONGER

The filament is the heart of a lamp. It must be perfect if the lamp is to give longer service, better light. Filament wires for Westinghouse Mazda Lamps are drawn through microscopic holes in diamonds—holes as small and as perfect as human and mechanical skill permit. If there were the slightest variation in their roundness, the life and the light output of finished lamps would be impaired. To insure perfect filaments, the diamond dies made and used by Westinghouse for making the finest wire are checked for roundness with a maximum tolerance of 5 millionths of an inch. This exacting requirement allows Westinghouse to produce lamps that are truly economical—lamps that give you more light—longer.



Over 480 tests and inspections of materials and processes go into the making of every Westinghouse Mazda Lamp. If any one of these tests or inspections were omitted, the quality of the lamp might be impaired. When you see the Westinghouse trade-mark on a Mazda lamp, you know that it is the best lamp science and engineering skill can make.

HOW TO JUDGE A LAMP

Lamps differ in quality. Inefficient lamps waste current and increase the cost of light. Our free booklet, *"How to Judge a Lamp"*, tells the important points to consider when buying lamps. Send for it today. Westinghouse Lamp Div., Westinghouse Elec. & Mfg. Co., 150 Broadway, New York, N. Y.

Westinghouse makes no compromise with quality

Westinghouse MAZDA LAMPS

Swimming Pools And Grandstands

■ Two developments of Pittsburgh-Des Moines Steel Co., Pittsburgh, are steel swimming pools and steel grandstands.

Grandstands are built in standard sections 18 feet long by 10 rows deep, each section seating 120 people. A grandstand may be any number of sections long or deep and it may also be double decked. Wood seat planks supported by steel brackets are securely bolted down. Aisles, at proper intervals, extend from front to back, with walkways along the front or back if necessary. Ramps or stairs may be installed at entrances or exists. Substantial handrails are provided to surround the grandstand, and if desirable, be used to divide the stand into sections.

Sides and bottom of swimming pools are made of steel plates ¼-inch thick. Fillet welding is used to attach the side and bottom. The inside weld is ground smooth. Stiffening and bracing members are provided on both the outside and inside to overcome pressure. The stiffening channels welded about the sides also provide a scum collecting trough and support for beach walks and diving platforms. Accessories such as ladders and piping for filling, draining, scrubbing and other connections are supplied along with diving equipment, floats, slides, lifeguard chairs, sand beaches, awnings, etc., if stipulated in the contract.

How Inventors Can Protect Their Ideas

■ *Inventions and Their Protection*, by George V. Woodling; cloth, 316 pages, 6 x 9 inches; 46 illustrations; published by Penton Publishing Co.; supplied by STEEL, Cleveland, for $5, postpaid; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is an intensely practical book for engineers, designers, machine tool builders, electrical engineers, mechanical engineers, steel mill engineers, machinery manufacturers, furnace builders, toy makers, rubber manufacturing companies, automotive engineers and others concerned with inventions and patents.

In 16 chapters covering 316 pages, the author presents patent law in a remarkably clear manner. Each chapter is well thought out and the facts are set forth clearly and concisely.

A sound and satisfying understanding of patent law, its design and administration, is impossible without a knowledge of the fundamental steps governing its structure, of certain significant facts determining its precepts, and of its precise use of words. A study of the work will clothe patent law with a new significance to many readers.

Nontechnical language has been used throughout. Much of the material has been inspired by actual questions which have confronted the author as an engineer and later as a patent attorney.

Not the least valuable part of the work are the charts which guide the reader into a simple understanding of the points in question. They show the factors governing the originality and ownership of inventions and the various requirements of patentability.

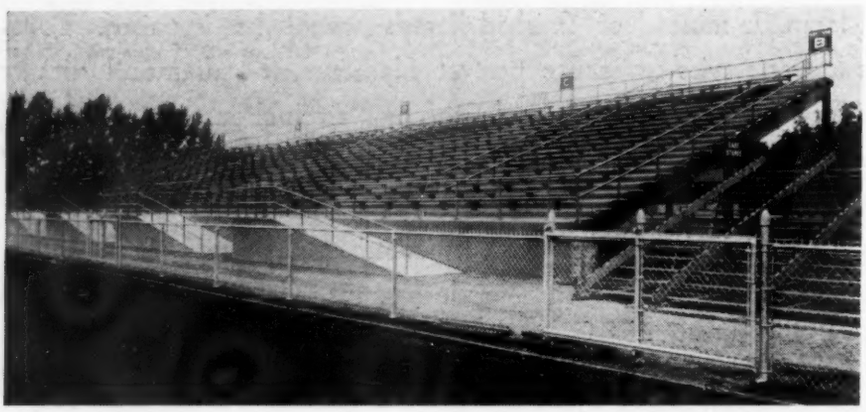
The author presents various diagrams in interpreting prior art which anticipates invention. The parties involved in the procedure are shown. The length of lines in the diagrams indicate the passage of time. In each diagram the length of time between actions is comparable to the length of the respective lines.

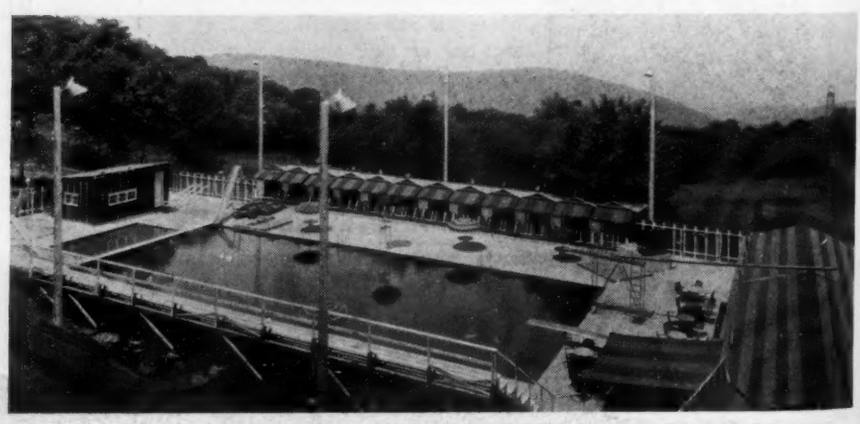
Interference procedures not only are explained in an understandable manner but are simplified by the citation of various examples.

The book explains authoritatively how to write a good patent specification, how to prepare amendments, and how to understand the way in which an invention is clothed with the legal protection necessary to enhance its economic value.

Sandurns Are of Steel With Stainless Trim

■ F. H. Lawson Co., Cincinnati, has developed for installation in theaters, hotels and other public buildings in which decorative treatment is important, a line of sandurns of improved design. Shown in the accompanying illustration is one of the styles made of steel with stainless steel trim. It has deep chromium plated sand container which is met at the top by a modernistic, stainless steel band. The wide, stainless steel band at the bottom is made to match. This style sandurn is available with bodies finished with baked





Above are two steel stands at Pennsylvania state college with a seating capacity of 10,560. They are supplied with ramps for entrances and surrounded by steel railings. At right is a steel swimming pool, showing all equipment including buildings and concrete work that may be supplied if necessary

One of a line of sandurns of improved design incorporating use of stainless steel and chromium plating

enamel in tile red, jade green, lemon yellow or black. The rigid decorative side handles are of the same color as the body. Sandurns in other styles, in the same colors, some with vertical side decorations of stainless steel, also have been developed by the company.

British Body Tests Copper Impurities

■ *Effect of Impurities in Copper* by S. L. Archbutt and W. E. Prytherch; fabrikoid, 134 pages, 6 x 9¾ inches; published by the British Non-Ferrous Metals Research association, London, England, and supplied by STEEL, Cleveland, and in Europe by Penton Publishing Co. Ltd., 416-17 Caxton House, Westminster, London.

Since the formation of the British nonferrous metals research association in 1920, it has carried out investigations on the effect of impurities on the properties of copper. Results of these were made known to its members from time to time, but now all that work has been summarized and reviewed in the light of present knowledge to form a single book.

It opens with an account of the scope, methods of preparation and testing materials and information on commercially pure copper. Then follow chapters on the effect of oxygen, hydrogen and sulphur; effect of iron, phosphorus and silicon; effect of bismuth and lead; brittleness in annealed copper; effect of arsenic, antimony, nickel and silver and combined effect of nickel, antimony and oxygen; combined effect of bismuth, arsenic, antimony, nickel and oxygen, two or more together.

Examination was made by tensile, impact, hardness, fatigue and bend tests on the mechanical side and by density and electrical conductivity measurements on the physical side. After a discussion of segregation of impurities, the authors present a chapter in which the comparative effects of various impurities are summarized. Numerous tables, micrographs and illustrations amplify the text, and the index is arranged so that the reader may find easily any particular reference he desires.

Metal Mining Register Covers Wide Field

■ *Mines Register*, cloth, 280 and 1340 pages; published by Mines Publications Inc., New York; supplied by STEEL, Cleveland, for $25; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is a successor to the *Mines Handbook*, which last appeared in 1931. In the seven intervening years numerous changes have taken place among metal mining companies in the United States, Canada, Mexico and South America. All changes have been traced and brought down to date. Descriptions are given of more than 4000 active mining companies and reference is made to more than 15,000 inactive.

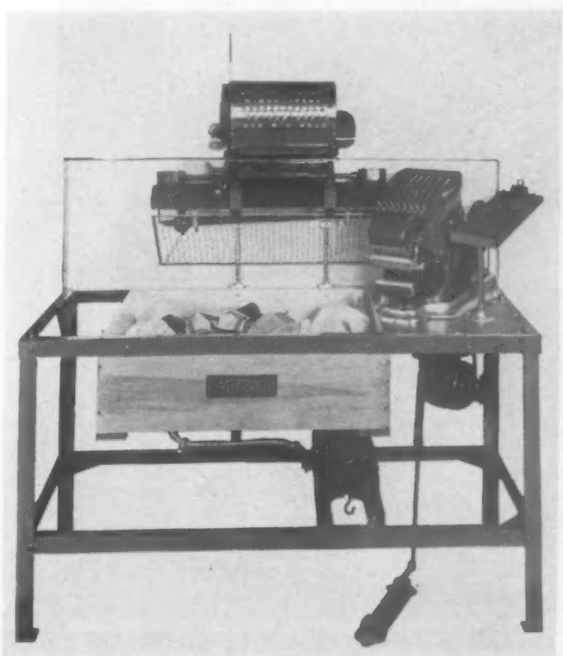
In the new edition mining companies are listed alphabetically, with subsidiaries and affiliates following the parent company. Each report gives the company's history, financial structure, mining properties, geology, officers directors, engineers, managers and purchasing agents.

Applies Laundry Marks Not Visible in Daylight

■ By means of a new fluorescent ink and a special machine for applying it, laundry now is identified by marks which are invisible in ordinary daylight but which stand out unmistakably on the laundry sorting table when subjected to near ultraviolet rays emanating from a mercury vapor lamp. This development eliminates one of the greatest problems besetting the laundry industry—that of identification without the use of unsightly ink marks. A remarkable feature of the new ink is that it is indelible and never washes out.

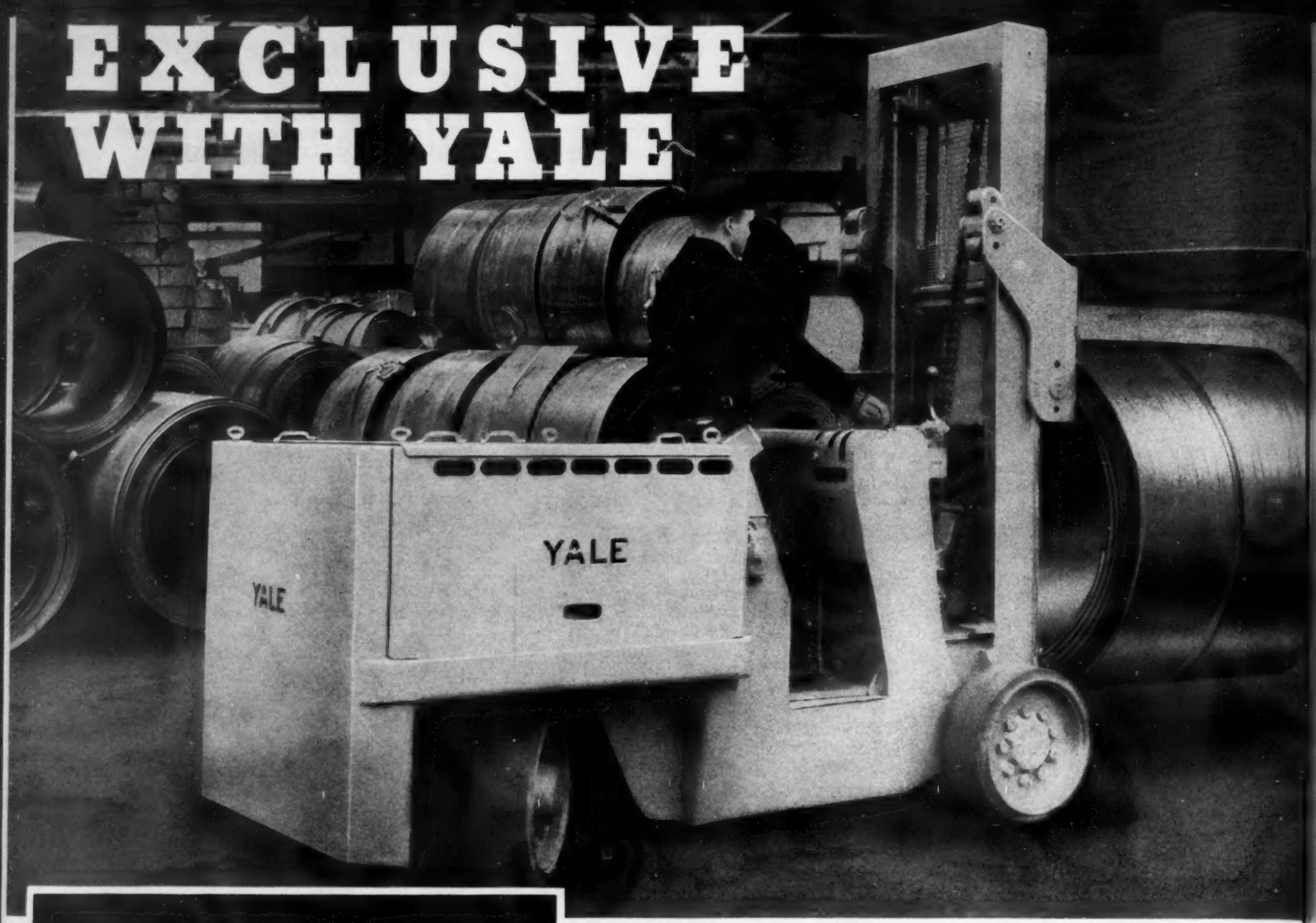
Both ink and marking machine are components of the recent "Fantom-Fast" marking process developed and patented by the National Marking Machine Co., Cincinnati. The machine has 8 large and heavily constructed type wheels which are inked automatically. With them any combination of letters, digits and spaces may be obtained. The marks obtained with the type wheels are approximately 20 times the size of ordinary laundry marks, thus reducing the likelihood of mistakes. The machine is so constructed that it will print on material the thickness of a bath mat or as sheer as organdie with no variation in results, it is claimed.

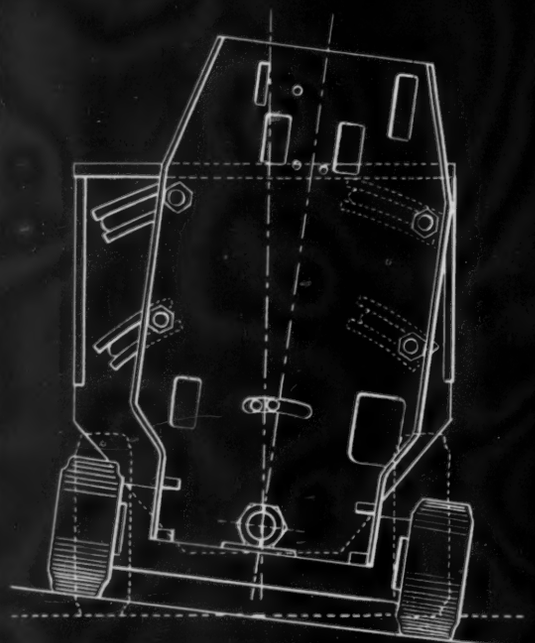
Manufactured entirely by this company in the Cincinnati plant, the machine is made up of cast iron frame, steel segments and gears, and the typewheels are die castings. In addition to this machine, the company also makes marking and sorting tables which are made up from angle iron and sheet metal construction.



Any combination of letters, spaces and digits may be obtained with this machine to mark laundry with ink visible only under a mercury vapor lamp

EXCLUSIVE WITH YALE





Diagrammatic view illustrating the "Caterpillar Action" of the New Articulated Yale Ram Truck — Just another economy feature that is Exclusive with Yale.

ARTICULATED RAM TRUCKS!

Always the leader, YALE again pioneers a noteworthy advance in electric truck development—The Articulated Ram Truck.

Revolutionary in design—the chassis is constructed in two units with the fore and aft sections rotating on a massive king pin. This provides a "caterpillar action" that makes it possible to operate over the roughest floors without fear of torsional strain—ELIMINATES TWISTED FRAMES!

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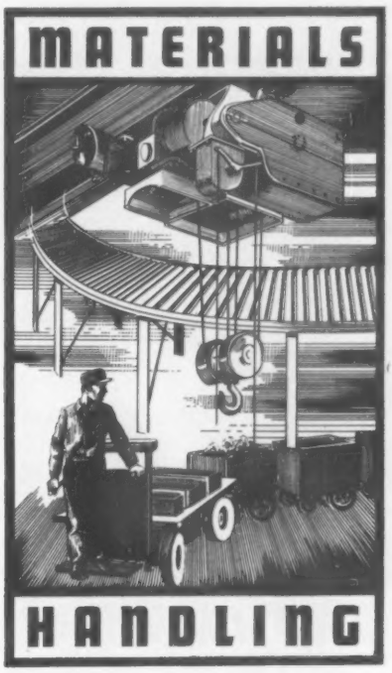

Manufacture of Nuts

Is Accomplished on Efficient Basis in Pennsylvania Plant Through Well-Organized Materials Control System and Adequate Handling Equipment—Specially-Designed Monorail Hoist and Buckets Are Key Units

■ Imprinting dates on packages and cartons is a familiar merchandising device used successfully by distributors of various products, particularly foods, to assure customers that the commodities contained therein are not shopworn or lacking in freshness. For most products of an enduring character, however, it is not common practice to mark them in such manner. Yet, the branch plant of Russell, Burdsall & Ward Bolt & Nut Co.. Coraopolis, Pa., specializing in the manufacture of nuts, places the date on every keg. As soon as a container has received its allotted quantity of nuts and the top has been secured, an operator stencils on it the ordinary identification marks and in addition indelibly stamps on the day, month and year.

This apparently minor detail in packing and shipping practice in the Coraopolis plant is in complete harmony with an efficient materials handling system. By careful control and supervision, coupled with planned transportation methods and equipment, raw materials flow from the receiving department through various operations of manufacture and out to freight cars and motor trucks with a minimum amount of delay.

Comparatively little space is required for finished product storage; examination of the keg dates at any time is proof of this. Although a sizable tonnage of scrap is produced each working day, the company disposes of it quickly, and, therefore, is not confronted with a storage problem attended by added overhead expense.

While the main plant of the company at Port Chester, N. Y., makes a complete line of bolts and nuts, as well as rivets, pins, screws, washers and other specialties, the Coraopolis branch confines its activities to nuts only. It is located on the Ohio river 10 miles from Pittsburgh, and contains approximately 110,000 square feet of floor space in an L-shaped structure of brick, steel and concrete. At one end of the plant is a covered receiving platform alongside of which runs a switch track. The main portion of the building is a one-story and basement unit at the upper end of which runs a second switch track, devoted entirely to outgoing freight shipments.

Raw materials, therefore, come in at one end, and until they have left the shipping department at the other end as finished product, there is a steady flow free from backtracking.

An indication of the size of the materials handling job is the fact

Fig. 1—Long, neat rows of special buckets feature the nut plant materials handling system. Two special electric hoist operators keep lots moving in required sequence

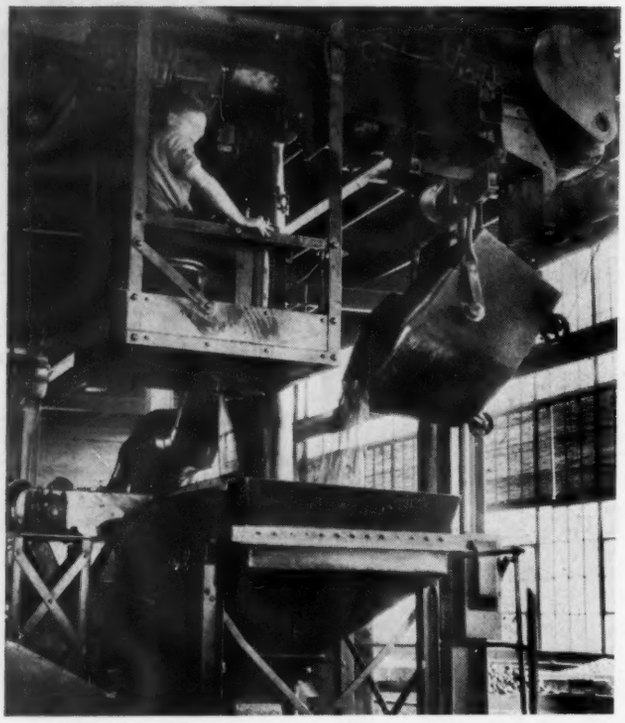

Fig. 2—Without leaving his cab, the electric hoist operator picks up a bucket load of nuts and delivers it to the hopper of one of the tapping machines

that in an ordinary month approximately 3000 tons of steel are cut up and formed into finished products. Upwards of 300 tons of steel are "in float" each day.

Approximately 90 per cent of the incoming steel arrives in the form of bars in 10-ton bundles 30 feet long, the remainder is received in coils. The bars are unloaded from gondola cars under cover by a 10-ton crane equipped with hoists and chain slings. In the storage bay the bundles are set on 4 x 4-inch timbers so that slings may be slipped beneath them readily when the bars are needed for processing.

From storage, the bundles are transported directly by the crane to the pickling tubs which are special V-shaped units designed by the plant's own engineers. Rollers on the sides of the tubs rub the scale off the bars after action of the acid has loosened it. Approximately 2.5 gallons of acid are used for each ton of steel.

Three Operations Performed

Three principal operations are performed in the manufacturing departments. First, the bars are cut to proper lengths and the nuts are formed in nut making machines; next the nuts are taken to the tapping machines; and finally they pass to the finishing machines. It is in connection with these major operations that the unusual part of the materials handling system shows up to best advantage.

Probably as high as 95 per cent of all materials in process is handled in special buckets shown in Fig. 1. These buckets, resembling large coal hods with pouring snouts, are constructed from heavy-gage sheet steel with short trunnions extending from the sides to permit engagement with sling arms which extend downward from the electric hoists. Each bucket has a capacity of 1800 pounds. Two electric hoists, each in charge of a skilled operator and traveling over a monorail system equipped with switches, do the lifting and distributing work. One hoist handles all nuts from forming machines to the tappers; the other distributes the tapped nuts to the finishing machines.

The materials control system functions from the moment an order leaves the office. One supervisor of materials has complete charge of all transportation within the plant. A tag with complete identification of an order is made out and attached to a bucket which handles that particular lot through manufacturing sequence. For special rush jobs, which entail promised delivery dates, red tags are utilized.

Operator Supplies Machines

Buckets are lined up in neat rows, as shown in Fig. 1, at the head of the tapping and finishing lines. As each machine in both lines is equipped with a hopper, the electric hoist operator merely picks up a bucket load, transports it down one or the other line to the machine requiring additional work, and dumps the nuts in the hopper as shown in Fig. 2. As the monorail runways are directly over the hoppers, the skilled hoist operators have knowledge at all times of the volume of supplies at all machines. Without leaving their cabs, these cranemen can pick up a bucket almost as rapidly as a man would seize the handle of a coal hod. From experience, they are expert at keeping the buckets in alignment on the floor.

Scrap material drops into spiral screw conveyors which discharge to chutes leading to the plant basement. Below these chutes are large buckets. A series of concrete runways has been built in the basement over which is operated a gas-powered industrial truck in charge of an operator, who handles all

(*Please turn to Page* 69)

Fig. 3—A view of the shipping department. Empty kegs are brought in and stored in special stake body trucks, and after being filled on a conveyor line and dated, are placed on corrugated steel skids. Electric trucks are used to load directly into freight cars on depressed tracks

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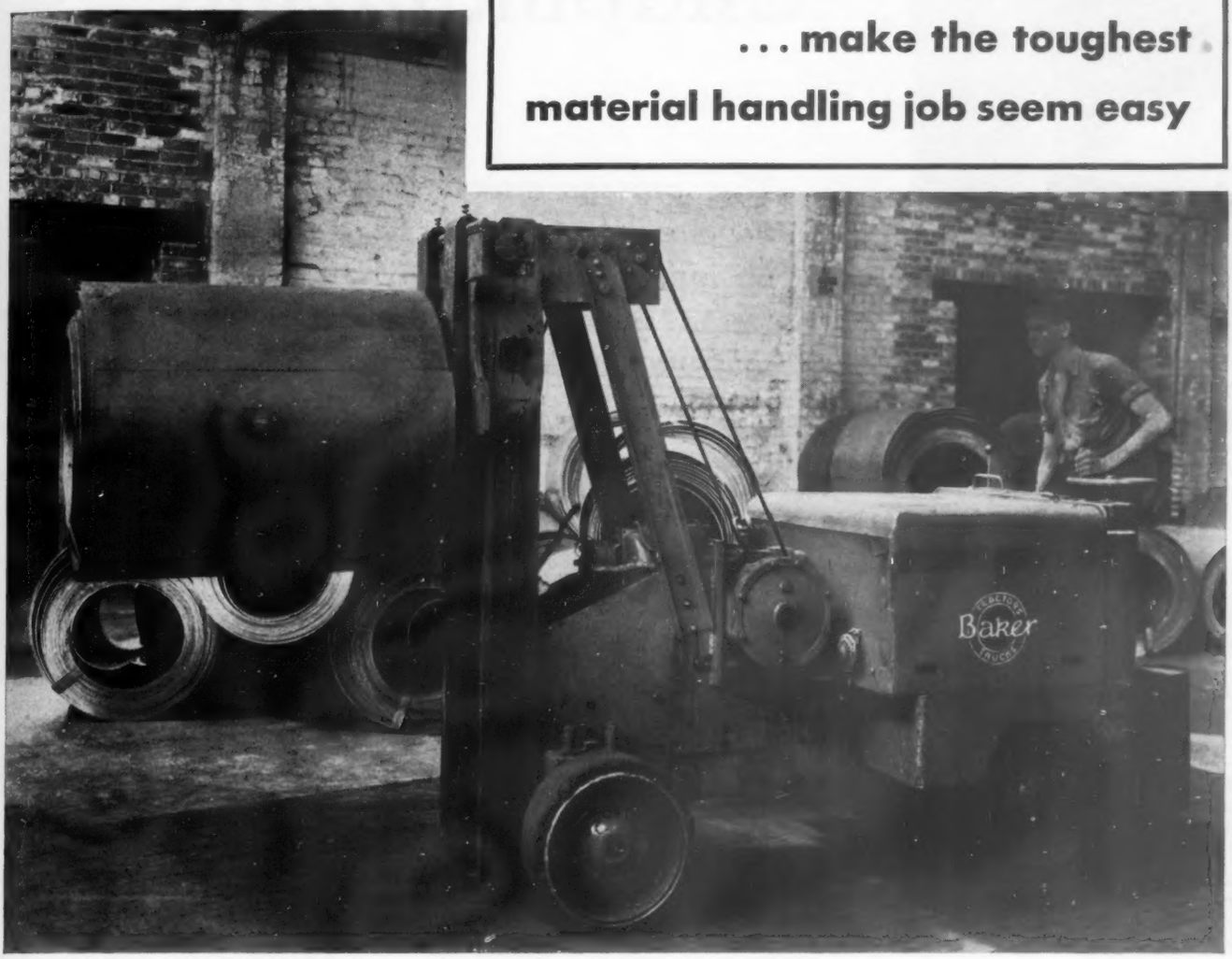

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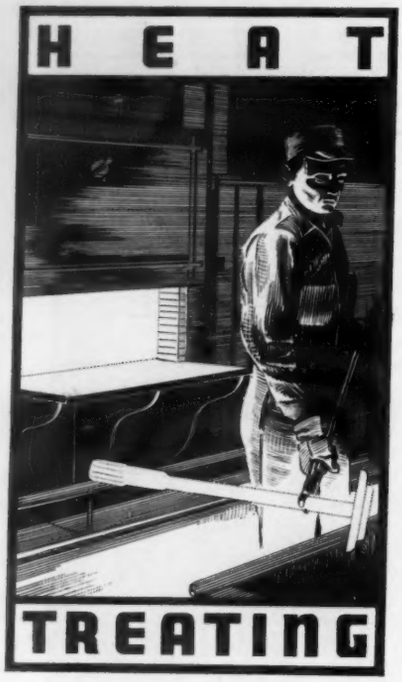


Chapmanizing

This process makes it possible quickly to develop an extremely hard nitrided surface on inexpensive, low carbon, free machining steels. Described in this article are the dry and wet methods of applying the process

By R. L. ROLF

■ FOUNDED in the metallurgical research laboratories of the Chapman Valve Mfg. Co., Indian Orchard, Mass., and named after this organization, Chapmanizing has carved a definite niche in the heat treating industry.

This process has permitted manufacturers to use inexpensive, low carbon, free machining steels and at the same time to take advantage of the extreme hardness of a nitrogen case. It has developed a means of nitriding these inexpensive steels in but a fraction of the time required by other methods.

Chapmanizing is divided into two distinct methods, the wet method and the dry method. The wet method is based on subjecting steel to be treated to the action of active nitrogen gas in a salt bath and then quenching, thereby producing on ordinary low carbon steels a case possessing maximum hardness. The dry method is based on the treatment of alloy steels in a container under pressure. In this container the articles absorb active nitrogen at a low temperature and a hard wear resistant case is produced with minimum distortion.

For several years it was assumed that nitrogen could enter steel only by placing the work in a container under pressure and dissociating ammonia gas which allowed the nitrogen to penetrate into the steel. According to the diagram, the eutectic in iron was 1246 degrees Fahr.

Recent investigations have found nitrogen will penetrate into steel as high as 1650 degrees Fahr. and there are a number of forms in which nitrogen will combine with iron to form different metallographic constituents of iron and nitrogen.

The Chapmanizing process is founded on the fact that if iron base alloys were heated above or below their critical temperatures they will absorb certain hardening elements. In the Chapmanizing process, the metal is heated in the presence of active nitrogen.

A typical Chapmanizing installation is illustrated in Fig. 1. Beside the usual controls it consists primarily of a pot furnace (a), a Chapmanizer (b). ammonia tanks (c) and the necessary piping to convey the ammonia gas to the Chapmanizer

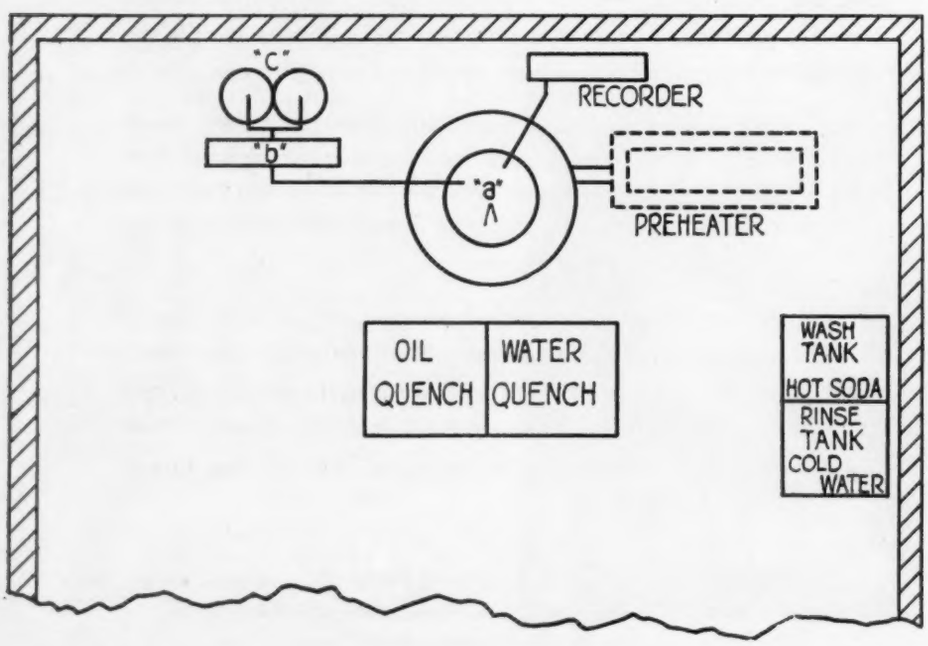


Fig. 1—Typical Chapmanizing installation with a pot furnace, Chapmanizer, ammonia tanks, piping, etc.

and the active nitrogen gas from the Chapmanizer to the liquid bath.

The liquid bath is used to bring the material to the desired quenching temperature and to convey the active nitrogen direct to the metal under treatment.

Anhydrous ammonia gas is supplied from pressure tanks to the "Chapmanizer" (Fig. 4) where it undergoes an electrical reaction producing an active nitrogen gas which is piped to the bath.

Introducing ammonia gas directly into the liquid bath is ineffective. Excessive quantities are required and if the ammonia is in unstable form most of the gas is oxidized, which produces a tendency to carburize rather than to nitride metals. It is the function of the Chapmanizer to transform the ammonia gas into an active gas possessing the exact properties necessary for the process.

Other than the "Chapmanizer" no special equipment is necessary. The furnace may be the regular pot type, fired by either oil, gas or electricity. Pyrometer control is necessary, and automatic temperature control is desirable but not essential. Work may either be immersed in the bath directly from room temperature or it may be preheated prior to immersion.

When material is plunged into the bath it is instantly coated with a layer of solidified compound which slowly melts preventing overheating of the surface and the distortion of thin irregular shaped sections. The molten bath, maintained at uniform temperature by convection currents supplies an even heat to all exposed surfaces. Since the total mass is small it loses or absorbs heat quickly which makes it possible to accurately control the time cycle.

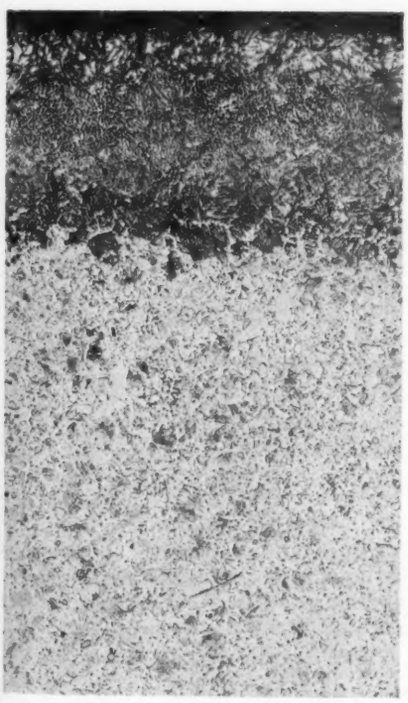


Fig. 2—A typical Chapmanized case. Depths range from 0.002 to 0.030-inch

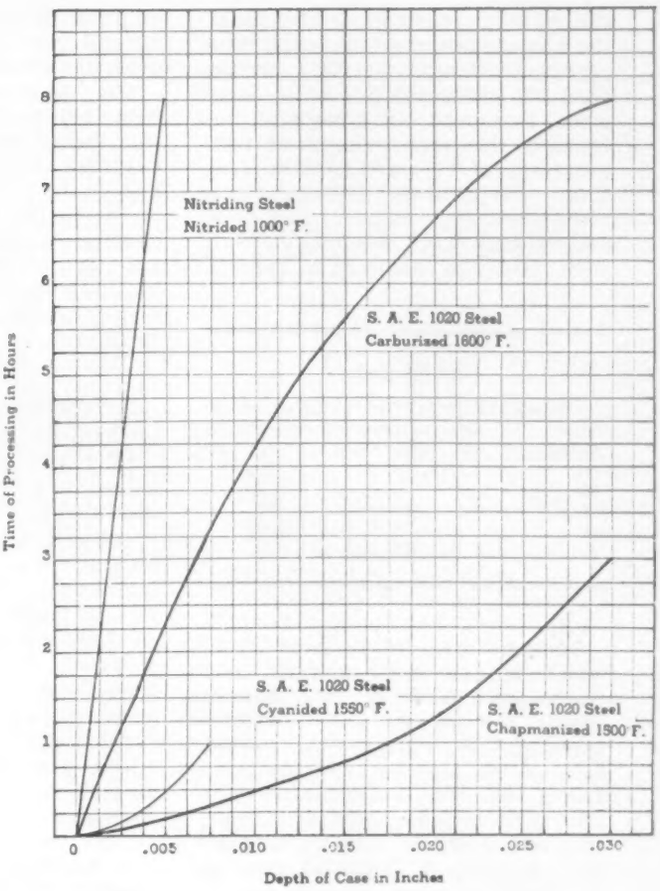


Fig. 3 — This shows processing time plotted against case depth, these curves comparing different methods of case hardening indicate the high speed of the Chapmanizing method

This method permits low carbon, inexpensive, free machining steels to be substituted for the more expensive special alloys necessary to other processes. Any type of steel regardless of its alloy or carbon content may be Chapmanized.

In the wet process, steels in the low carbon category (0.15 to 0.24) readily adapt themselves with excellent results as regards case structure, case hardness and core refinement.

Quenching low alloy or the carbon steels in a fast oil produces a hard case with very little distortion, while quenching in brine or solution produces a very hard case, together with excellent grain refinement. The quenching media should be governed by the design of the part being treated, those of intricate design requiring a cooling media having a slower rate than that required for heavy and bulky specimens.

A typical Chapmanized case is illustrated in Fig. 2. Case depths ranging from 0.002 to 0.030-inch can be obtained, the time required being but a fraction of that necessary to produce a case of equivalent depth by other methods.

This is clearly illustrated by curves in Fig. 3, which compares the processing time against case depth as obtained by four different methods of case hardening, such as carburizing, cyaniding, nitriding and Chapmanizing.

Temperature variation influences

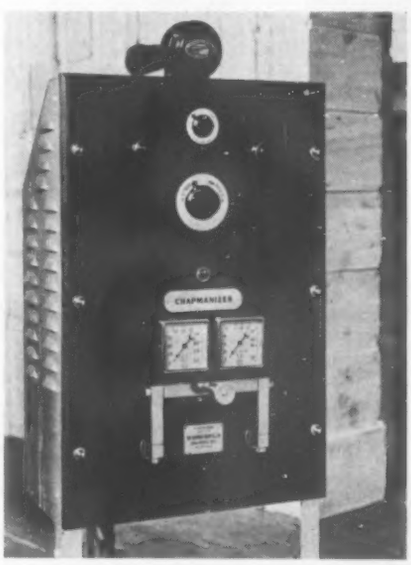


Fig. 4—Chapmanizer which produces an active nitrogen gas from anhydrous ammonia gas by an electrical reaction

the rate of penetration, the lower the temperature the longer the time required. Samples of 0.17 carbon steel 1¼ inches Rd x 5 inches long were immersed in Chapmanizing baths of the same strength at temperatures of 1450 and 1550 degrees Fahr. respectively. Test specimens were removed every half hour and the case depth carefully checked with results as tabulated in Table I.

TABLE I

Time	Temp.—1450°F. Case in inches	Temp.—1550°F. Case in inches
30 min.	.005	.008
60 "	.011	.017
90 "	.016	.021
120 "	.019	.026
150 "	.023	.027
180 "	.026	.031

Temperatures for light cases, in which the case is all nitrogen, may range from 1250 to 1400 degrees Fahr. For regular work temperatures of 1500 degrees Fahr. appear to give the best results. In processing at low temperatures the time is increased considerably above that where higher temperatures are used, however if additional time can be spent excellent results can be accomplished.

In regular process work the monotron hardness will range from 700 to 1000 depending upon the treatment and work processed. We cannot anticipate a heavy bulky section to produce the same hardness as a small section nor can we expect the same hardness from an oil quench as that obtained by quenching in a drastic solution.

An illustration of hardness as compared to case depths may be found by referring to Fig. 5 which compares the hardness as obtained on S.A.E. 1315. This monotron brinell will vary with the temperature used, and chemistry of the material.

The penetration and hardness will remain constant for type of steel being treated. The maximum hardness will be found about 0.002-inch to 0.003-inch below the surface, and while the hardness naturally recedes as additional case is removed, still, for an established depth, the hardness is superior to that produced by the standard carburizing method.

Checking hardness on Chapmanized and also carburized and hardened specimens through reduction of diameter by grinding in steps of 0.005-inch from surface to core, we establish a series of curves as illustrated in Fig. 6.

Chapmanized work may be operated at temperatures up to approximately 600 degrees Fahr. without loss in hardness, and after heating to 1000 degrees Fahr., Chapmanized parts still retain a greater hardness than carburized parts which have not even been submitted to a drawing operation.

Fig. 7 illustrates the high hardness of Chapmanized cases which is maintained practically uniform up to 600 degrees Fahr. at which point the hardness begins to drop off rapidly but even with the sharp drop, at a temperature of 1000 degrees Fahr. a hardness of 700 monotron is observed.

Carburized sections maintain a uniform hardness to approximately 350 degrees Fahr. where the hardness begins to fall off with great rapidity, while cyanided work starts to lose hardness as soon as heat is applied.

The extreme hardness obtained by this method would tend to indicate brittleness, but contrary to this, Chapmanized cases are so ductile that they will neither chip nor flake

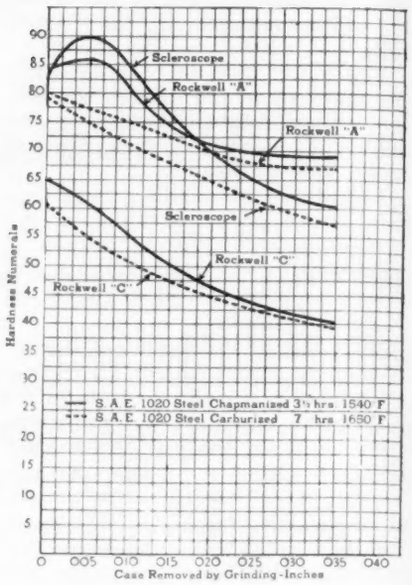


Fig. 6—These curves show a check on hardness through reduction of diameter by grinding, the same steel being used to show comparison between Chapmanized and carburized specimens

under hard service and deep bends and draws may be made without rupturing the case, providing the core is in the proper condition.

Stamping manufacturers have taken advantage of this and have Chapmanized blanks prior to final forming, thus eliminating a sizing operation.

The tough core combined with a ductile case makes straightening a

TABLE II

	Loss in Weight Grams per sq. inch
S. A. E. 1020 Steel Chapmanized VS S. A. E. 1020 Steel Chapmanized —Chapmanized 2 Hours	.0017
Nitrided Steel VS Nitrided Steel Nitrided 70 Hours	.0018
Carburized Steel VS Carburized Steel Carburized 10 Hours	.013

comparatively simple operation. Irregular shapes, comparatively long pieces, thin and flat sections may be readily straightened cold without danger of rupture.

Chapmanized metals are capable of holding their surface under heavy sliding pressures and will withstand severe abrasive wear.

The careful work of Mr. V. T.

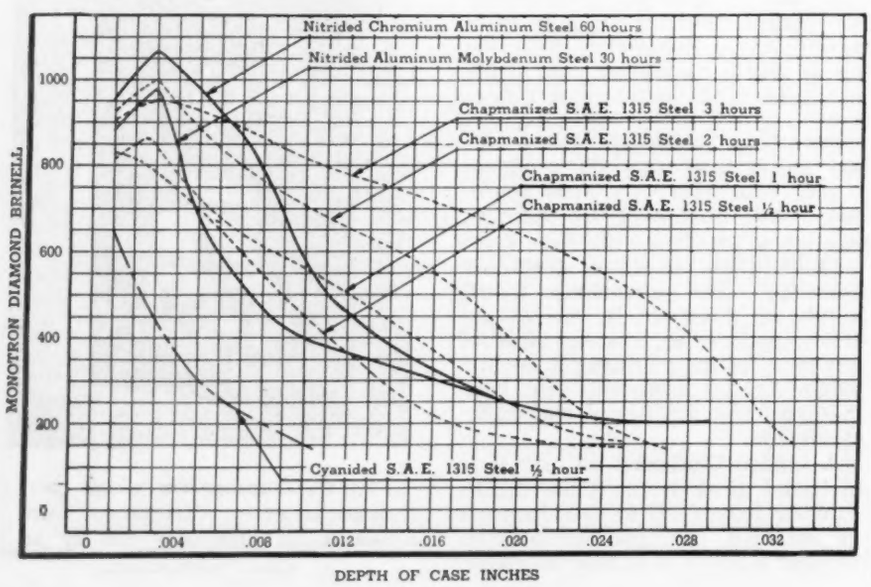


Fig. 5—Here hardness and case depths are compared for various treatments and materials

Malcolm, director of research for the Chapman Valve company has proven that Chapmanized metals will outwear carburized materials about nine to one.

Table II indicates his findings as obtained on a wear testing machine, running the materials dry against each other with a reciprocating motion, using 2-inch strokes at the rate of ninety per minute, with a load of forty pounds per square inch and for a total of 30,000 strokes.

The high degree of hardness obtained by this process, according to Mr. Malcolm is the result of slip interference due to the formation of large quantities of nitrides caused by the reaction of nitrogen with the steel. In plain carbon steels the absorbtion of the active nitrogen results in the formation of insoluble nitrides which, on rapid cooling are placed in a state of critical dispersion and are firmly fixed, and therefore set up considerable slip interference. As the nitrides that are effective in producing hardness are stable bodies and are large in comparison with the lattice dimensions, agglomeration due to migration can only take place with great difficulty, and according to this theory a considerable increase in hardness must be anticipated in cases where these numerous inclusions (nitrogen) are present in a critical state.

In nitrided cases the hexagonal close packed lattice appears to be associated with surface hardness and brittleness. Hardened cases showing face centered cubic and alpha iron lattice were found not being brittle.

The alpha iron lattice is found in the Chapmanized case. This would tend to conclude that the extreme hardness of Chapmanized cases may be accounted for by the presence of nitrogen in solution in the alpha iron lattice, and it is assumed that a finely dispersed phase exists in these areas.

Assuming the above conclusions to be correct then it remained to develop a satisfactory method of producing the alpha iron phase in ordinary commercial steels. It is believed that by the activation of nitrogen by ionization as produced in the Chapmanizer from the ammonia gas and then introducing this active ionized gas into a liquid bath, the steel is made to act as its own catalyzer and the special structural constituent in this alpha iron lattice then became possible and the nitrides are in a finely dispersed stable condition. These reactions are made possible by the mechanism of the Chapmanizing process whose success depends, first: On the decomposing of ammonia into an active gas and free hydrogen; that the metal in the bath be contacted by the nitrogen at the temperatures used and the burning off of the free hydogen. Second: Interaction of nitrogen with metallic elements to form certain stable iron nitrides, by the utilization of the steel itself as an active catalyzer. Third: The diffusion and dispersion of the stable nitrides through the crystal aggregate, forming a particular structural constituent with the iron in the temperature of the processing cycle.

The development of this particular constituent is dependent upon several essential points:

1.—Constant temperature control.
2.—A uniform distribution of the active nitrogen gas.
3.—Complete ejection of the hydrogen gas by burning off.
4.—The entire elimination of oxygen from the bath.
5.—Inert metal parts handling the active gas.
6.—The proper nitrogen content of the bath itself.
7.—The selection of the proper quenching medium.
8.—The placing of the Chapmanizing unit at the proper distance from the liquid bath.

With the proper handling of the Chapmanizing equipment the nitrogen molecules will form rapidly and penetrate the steel, and it is these molecules of nitrogen that make the hardness of Chapmanized steel possible.

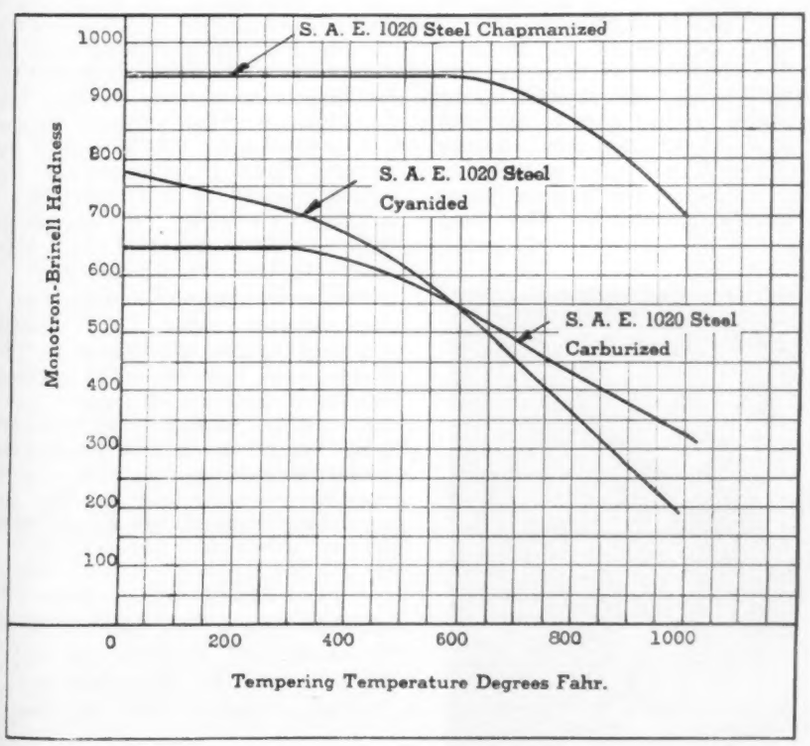


Fig. 7—Comparing hardness and tempering temperature for various methods, these curves show Chapmanized case to maintain its hardness up to 600 degrees Fahr.

Lacquer Effectively Resists Rust Inhibitors

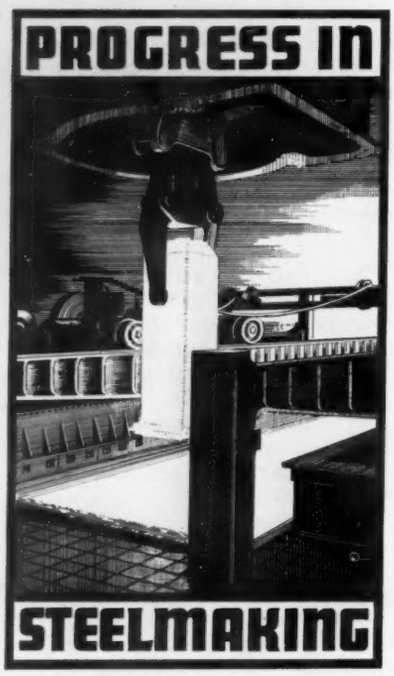
■ Lubricating oils containing rust-inhibiting substances are widely used in equipment that is to be sealed and operated for years without attention, such as mechanical refrigerators, electric clocks and similar items. The rust-inhibiting chemicals create a finishing problem, however, as they react actively with ordinary lacquers and discolor them badly.

To overcome this difficulty, Maas & Waldstein Co., Newark, N. J., has developed a special type of clear lacquer said to effectively resist the action of all commonly used rust inhibitors, salt spray, 10 per cent hydrochloric acid, high humidity and outdoor exposure. As it is tough, durable and strongly adherent, it is suitable for use on articles subsequently stamped, formed, etc.

Rubber Can Be Sprayed With Metallic Finish

■ It is often desired to give rubber parts or products a metallic finish that will harmonize with the metals with which they will be used.

To make this possible, a special bronze lacquer for rubber has been developed by Maas & Waldstein Co., makers of industrial finishes, Newark, N. J. This special rubber lacquer makes it possible to cover semistiff rubber with a strongly adherent, durable finish resembling brass, copper or other metals.



Modern Steel Mills

New mill enables Wisconsin Steel Co. to make blooms up to 12 x 12 inches and slabs up to 30 inches wide. New continuous bar mill rolls billets and flats

■ A MODERNIZATION program involving a $6,000,000 expenditure recently was completed by Wisconsin Steel Co., subsidiary of International Harvester Co. The major portion of this was spent in the building of the new blooming mill. The balance represents construction of a 21-inch continuous billet mill and rehabilitation of one of the plant's four merchant bar mills.

Wisconsin Steel works, located on the Calumet river in South Chicago, Ill., passed into possession of International Harvester Co. at the time of the latter's organization in 1902. A predecessor company, the Joseph H. Brown Iron & Steel Co., founded in 1875, had been the oldest iron and steel company in what is now the great steel-making district of South Chicago.

When the works was acquired by the Harvester company in 1902 it consisted of a rolling mill, a cut nail mill and one old blast furnace, known as the "A" furnace. The plant since has been enlarged from 55 to 202 acres and today includes 132 by-product coke ovens, three 600-ton blast furnaces, a modern pig-casting machine, nine 100-ton basic open hearth furnaces, a 21-inch billet mill, four merchant bar mills, one cold drawn mill and the modern blooming mill. Two large bulk ore freighters, HARVESTER and INTERNATIONAL, are owned by the company and carry ore to its furnaces.

Wisconsin's production capacity has increased from 108,000 tons of rolled steel in 1903 to 564,000 tons in 1937, and from 200,000 tons of pig iron in 1903 to 643,000 tons today. Open hearth capacity now is 600,000 tons. About half of the company's product goes to the various agricultural implement, tractor and automotive plants of the Harvester company, the balance going to outside customers. The modern blooming mill will afford additional production for the trade and is a well-planned scheme of plant enlargement.

The extension of the blooming mill department at this time was contemplated years ago, when a 40-inch reversing blooming mill was constructed. The 40-inch mill constructed at that time was the first unit in the now completed department.

The mill, as stated above, constructed as a first step in the future plans for this department, was housed in a building 325 feet long with 90-foot span. At right angles to this, at one end, was located the pit building, 425 feet long with 75-foot span. Directly outside the pit building is the stripper building having two overhead stripper cranes for big-end-down molds and a hydraulic ram-type stripper for big-end-up molds. In order to facilitate quicker stripping of big-end-up ingots, new equipment has been added to the stripper cranes.

The pit building is equipped with two charger cranes. In this building is a row of six 4-hole pit furnaces, each hole being 9 x 6 feet taking an 85-inch-high ingot. These pits, of the regenerative type, are now heated by mixed coke oven and blast furnace gas. Automatic regulation of the gas mixture and automatic maintenance of gas pres-

General view of the new 40-inch blooming mill, showing the mill in foreground and crop shear and 32-inch blooming mill in rear

sures are obtained by a modern-type gas regulator. Prior to using mixed gas for heating, these pits were heated with gas from five gas producers located in an adjacent building. A reversal on these pits is obtained by a rotating-type valve installation.

Ingots are delivered from the pits to the table rolls by an ingot buggy controlled from a pulpit in line with the mill table rolls. The 40-inch blooming mill is a 2-high reversing mill driven by a 7000-horsepower, direct-current motor with a speed variation from 50 to 120 revolutions per minute. This motor is driven by a 3-unit, motor-generator set consisting of two 3000-kilowatt generators and one 4000-horsepower, wound rotor induction motor. This induction motor takes 2300 volts.

Manipulator Electrically Driven

Manipulation of the bar in the mill is taken care of by an electrically driven manipulator with an overhead finger lift mechanism. The mill is connected to the motor by spindles and pinions. The rolls for this mill are 92 inches long having a bullhead pass and other passes of 12, 8, 6, 3, 5 and 4 inches. The products rolled on this mill, prior to the completion of the new units, were billets from 4 x 3 inches to 8 x 8 inches and slab billets and slabs from 5 to 30 inches in width. At this time, the product on leaving the mill was transferred on a 145-foot rail and cable transfer to the shear approach table and sheared by an electrically driven shear of 160-square inch capacity.

Following the shear was a movable depressing table. As the table moved back the crops were dropped into a chute and discharged on a conventional-type chain conveyor. The conveyor carried the crops to pans which were quenched in a quenching tank and thence to cars. Inasmuch as the product of this mill was cut into lengths averaging 12 feet when they left the shear, they were kicked off by a grasshopper-type kickoff onto a billet conveyor and into stake cars.

Average rolling capacity of the mill at that time was about 40,000 tons per month. Some additional tonnage was rolled on the old steam-driven, 35-inch blooming mill that was built in 1903. The abandonment of the old mill was to be made possible by the construction of the newer units. Therefore, in the plans for the construction of an extension to the 40-inch mill, consideration was given to increased capacity, greater diversification of sizes rolled, together with improvement in the quality of the mill product. In order to provide more suitable billets for existing finishing mills, great flexibility was necessary in the newer units.

To accomplish this, the construction of an additional reversing bloomer and a continuous mill was begun. These units are housed in a 475-foot addition to the main mill building, making the main mill building 800 feet overall, with a cooling bed building 200 x 73 feet alongside. The addition to the main mill building is of standard conventional design with the exception that sloping skylights are provided in the monitor.

The contemplated extension to this department was completed and put into operation in September, 1937, with the possibility of at least doubling the former capacity, if needed.

Housed in the 800-foot main mill building is the 40-inch bloomer, a bloom crop shear, the 32-inch bloomer, a billet and slab shear, two transfers, a 6-stand 21-inch continuous mill followed by a flying shear, finishing end tables, shear and cooling beds.

Following the 40-inch bloomer delivery tables is a 58-foot 1-way cable transfer, and in line with the mill is an up-and-down-cut crop shear of the newer type driven by a 150-horsepower, alternating current motor. This shear has capacity of 180 square inches. It is equipped throughout with roller bearings and has an individual lubrication system. The blooms that come from the 40-inch mill are cropped of pipe on this shear and then transferred on the 58-foot transfer to the 32-inch mill approach tables. The crops drop directly into a chute, from there to the skip buggy and from the buggy directly into cars. The 32-inch mill tables are provided with roller bearings and are automatically lubricated by a modern grease pressure system.

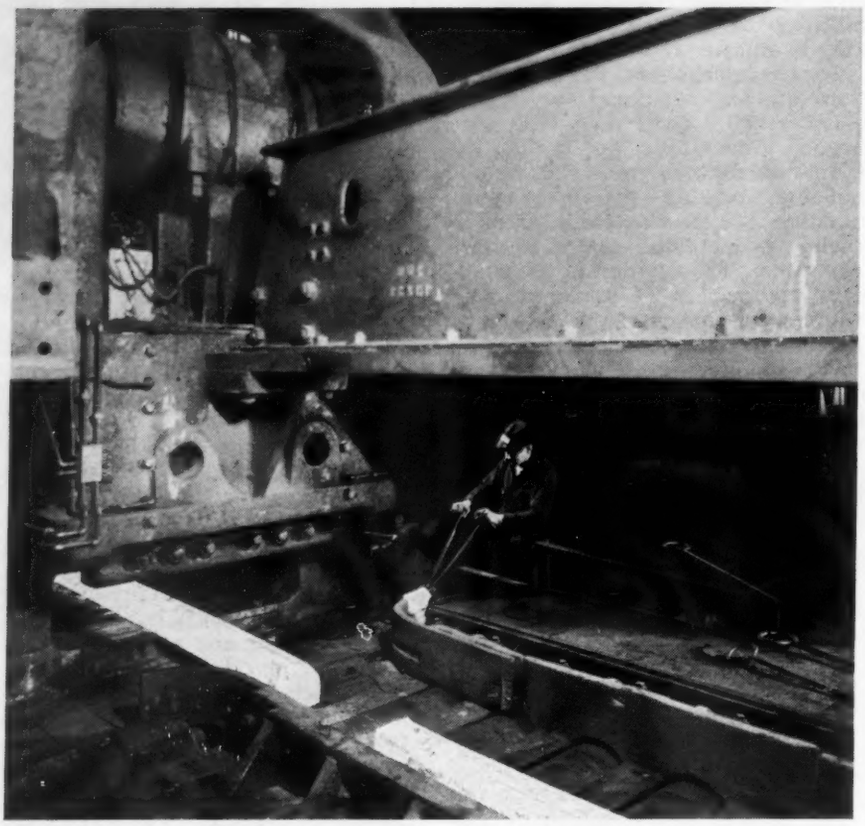
The 32-inch mill is a 2-high reversing unit connected by spindles and pinions with a 4000-horsepower, direct current motor. This motor is driven by a 3-unit, motor-generator set consisting of two 2000-kilowatt generators and one 3000-horsepower, wound rotor induction motor, taking 6600 volts.

Manipulation of the bar at this mill is taken care of by a manipulator with heads on both sides of the mill. It is possible to turn the bar on either side of the mill. Speed on this mill may vary from 75 to 165 revolutions per minute. The mill takes a 72-inch roll, having a bullhead pass, and other passes of 8, 6, 3, 5 and 4 inches. This mill rolls billets from 4 x 3 inches to 8 x 8 inches and slab billets and slabs from 5 to 24 inches wide.

Screws are worm driven and the mill is equipped with a phenolic-resin-type bearing. The screws are lubricated separately. The pinion stand has an individual lubricating system with a tank and a small electrically driven pump. Lubrication of the mill roller bearings and the manipulator roller bearings is taken care of by the main grease system.

From the 32-inch mill the bar is delivered to a 150-foot 2-way cable

View of 32-inch blooming mill with manipulator in foreground



Shearing billets that have been finished in the 32-inch blooming mill. Crop transfer table is shown between shear and shear table

transfer where it is transferred to the delivery tables of a down-cut shear that is in line with the crop shear and 40-inch mill unit. The two transfers are connected by means of a table so that wide slabs and blooms may be rolled on the 40-inch mill and sent through the crop shear to the down-cut shear and then delivered to cars.

The down-cut shear, driven by a 200-horsepower, alternating-current motor, has a capacity of 180 square inches. This shear is provided with a hydraulic hold-down ram, individually driven crop pusher and a 30-foot electrically operated screw gage. A crop delivery unit attached to the end of the depressing table immediately following the shear has been provided. This unit is built on the endless-chain principle and delivery crops from this shear sideways to a chute, from the chute to a skip buggy and from the skip buggy directly into cars.

The table following the shear is equipped with a disappearing stop. Billets sheared to lengths of 15 feet or less are stopped at this point and an overhead, electrically-driven push-off discharges the billets onto a billet conveyor and thence into stake cars. Following the disappearing stop and pushoff is a run-out table provided with a hot-saw. It is possible to hot-saw billets as long as 30 feet.

These billets may be kicked off by an endless chain kickoff into a 30-foot cradle just beyond the hot-saw. These billets are transferred from the cradle to a covered billet yard adjacent to the mill building by means of a billet transfer car where the billets are slow-cooled, should that be required, or where they may be loaded into standard-gage cars.

The 150-foot transfer is a double transfer, and it is possible, therefore, to roll blooms for the 21-inch continuous mill which is in line with the 32-inch mill on either the 40 or 32-inch mills, thus providing greater flexibility.

Floor view of 21-inch continuous mill and rotary flying shear

Spaced Far Apart

As stated, the 21-inch continuous mill is in line with the 32-inch mill. The 21-inch mill consists of six roll stands and two edger stands. These stands are spaced as far apart as available room would permit. The distances between the stands are: No. 1 to No. 2 stand 14 feet; No. 2 to No. 3 stand 18 feet; No. 3 to No. 4 stand 14 feet; No. 4 to No. 5 stand 18 feet; No. 5 to No. 6 stand 12 feet.

Roll speeds on the various stands, in revolutions per minute, are: No. 1, 18 to 36; No. 2, 24 to 48; No. 3, 33 to 66; No. 4, 43 to 86; No. 5, 56 to 112; No. 6, 70 to 140.

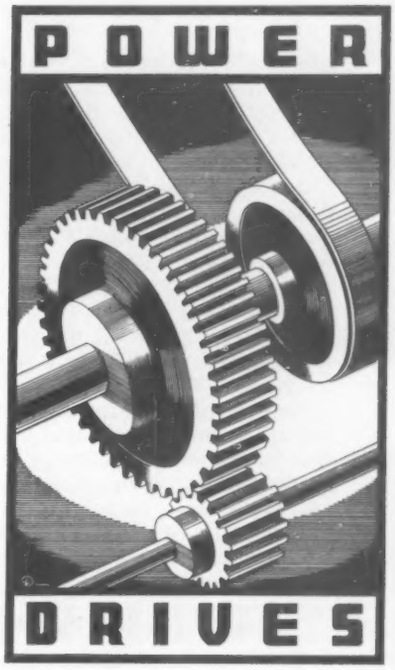
Housings have been provided for both billets and wide flats. The billet stands are of very rigid construction and take a roll with a 32-inch body. Roller twist guides have been installed throughout the billet mill, and each stand is separately driven, permitting independent control and regulation of speed of each. The first two stands are each driven by 1500-horsepower, direct-current motors and the remaining four stands by four 2000-horsepower motors.

These motors are driven by a 3-unit, motor-generator set consisting of two 3500-kilowatt generators and one 9970-horsepower synchronous motor. This motor takes 6600 volts. The stands for both billets and bars have been equipped with phenolic resin-type bearings. Speed regulation of the stands is taken care of by an operator in the control pulpit located on the wall opposite the mill.

Fixtures on the mill are of the conventional type. A choice of materials for guides, etc., was made with every precaution taken in order to maintain and produce a

(*Please turn to Page* 70)

Tracing Electrical Troubles Down to Mechanical Failures



■ ELECTRICAL troubles are caused by mechanical failures is still the assumption of an old-time practical electrician with good theoretical training, who has had remarkable success as a service man for a manufacturer.

His experience has taught him that simple little things which are overlooked in the search for some theoretical reason are often the underlying causes of trouble. He knows that unless the primary cause is removed no amount of doctoring or theorizing will prevent a recurrence of the trouble sooner or later.

By the time he is called on trouble work most of the theoretical reasoning has been applied. One of the first acts, where electrical trouble is indicated, is to check connections, which is really a mechanical trouble. The next step is to check alignment wherever it could possibly be responsible. This often locates loose bolts or mountings which throw an excessive overload on the equipment, and results in a drive running hot for no apparent reason.

Meter readings on power consumption quickly show where an overload is at fault. Such overloads may be due to mechanical faults in the drive, especially in alignment, gearing or bearings, or in additional load having been added an additional load having been added by changing speed, product or some driven.

Wiring Is Rechecked

When these mechanical possibilities are exhausted, he again goes over the electrical possibilities, checking and double-checking all wiring, connections and insulation until the trouble is located and corrected.

Here is an example of apparent electrical trouble, which was mechanical. A starting lever would not stay in position but continually dropped out while running. No-voltage release had been adjusted, contacts renewed and numerous other adjustments made. Yet, in each case, the machine operator still had to prop the handle in position to keep his machine running. The service man drained the oil to give a more thorough examination of all parts and found several screws lying in the bottom of the oil pan. These screws had worked out of the frame holding the starting mechanisms. When screws were replaced and tightened and the no-voltage release reset the starter operated satisfactorily.

Conversely electrical troubles sometimes show up as mechanical difficulties. For example, a motor running hot, but not hot enough to burn out, may have transferred enough heat through the shaft to the bearings to cause bearing trouble. Like a good doctor, the trouble man should trace all troubles down to the inherent cause.

If permitted, this trouble man prefers to make his own investigations without suggestions or opinions of operators, if the equipment can be operated. Usually the operators have tried everything that in their experience indicates may be the cause or cure. If they had been correct, the cause of the trouble should have been located. Therefore, he is interested only in symptoms, high temperature, irregular operation or dizziness, sluggishness, etc., rather than the cures attempted or diagnosis made. Knowing the troubles he would like to form his own conclusions rather than be misled by probable incorrect conclusions of others.

The most important requirement of all trouble work, whether performed by an outside service man or the plant trouble shooter, is to trace the difficulty down to the underlying cause. Any patch-up of the symptoms is like taking a headache tablet, because a headache is only a symptom and the underlying cause may be far away from the head. When the effect of the tablet wears off the headache is still there. Similarly the starting mechanism, previously mentioned, never could have been adjusted to work properly until the loose frame was tightened so that it would not spring.

A safe practice to follow in trouble work is that whenever equipment failure repeats is to go over the equipment in trouble and all associated units, carefully testing each part individually and eliminating different elements until the difficulty is traced to some part or group of parts. A most rigorous examination will disclose the cause which, in many cases, turns out to be so simple as to have been overlooked in the search for more baffling difficulties.

Bearing Lubrication Should Be Controlled

■ The manufacturers of antifriction bearings have perfected their production to a point where friction of the bearing alone is practically negligible. In operation, bearings must be protected against corrosion, fumes or moisture and the entrance of dust particles, which necessitates some form of lubricant.

Friction of an antifriction bearing in operation on moderate loads is largely due to the lubricant rather than to the metal-to-metal rolling action. For this reason the consistency of the grease or viscosity of oil used in very important. Too heavy or too much grease increases the friction load, causing bearing to heat from the work required for the balls or rollers to plow through thick or packed grease.

The lubricant, therefore, must protect the highly finished surfaces from corrosion and at the same time resist the rolling action as little as possible. This explains why manufacturers of bearings recommend using the lightest grease possible, and in small quantities. The grease must be of sufficient consistency to stick to all surfaces of balls and race of the bearing during long periods of idleness to protect the surfaces from corrosion. In addition, the grease must not dry or harden when idle, because hardened particles of grease will be disastrous to the bearings.

The problem of stability of a lubricating grease through periods of idleness, as well as operation, has been the most difficult to solve. Installations where the bearing is exposed to temperatures above atmospheric or to wide variations in temperatures further complicates the problem.

Introduction of factory-sealed antifriction bearings, which operate for the life of the equipment without further attention, has necessitated the perfection of greases

which will maintain their lubricating characteristics and semifluidity indefinitely. Without such a lubricant this type of bearing could not be installed.

Bearing manufacturers have made extensive tests and research on lubricants suitable for their bearings to prolong life and operation of their bearings. The manufacturers have no way of controlling the use and servicing of their bearings except by education and recommendations.

Because of the churning and channeling action of grease at high speeds, high-speed bearings are generally lubricated by oil. Oils, however, require better seals than greases. The oil must be of the noncorrosive type and must not deteriorate when idle.

Bearing Action Puzzling

This action of antifriction bearings is not well understood by many operating men, especially when first beginning to use such bearings. These men, who have always been accustomed to lubricate at least once a week, or perhaps daily, think that lubricating only every 3 or 6 months cannot be enough and give the bearing the gun every once in a while, just to be safe. Heating, in their opinion, calls for more lubricant and apparently justifies their assumption that the bearing had been neglected too long.

Bearings have been packed so full of grease under pressure as to destroy the seals or at least greatly increase the power consumption required to pull the bearings through the almost solid mass of lubricant. The only practical preventive is to place such lubrication in the hands of experienced men who operate on predetermined schedules.

Application of Power to Maintain Constant Ratio

■ Application of power from a high-speed motor to slow-speed shafts on a machine often requires careful engineering of interconnecting drive elements. How drive was arranged on a machine to give variable speed production with a constant operating ratio between input and output shafts of the machine is shown in an accompanying illustration.

This drive could have been greatly simplified if it had not been necessary to maintain a constant speed ratio of 137.3 to 1 between the two machine shafts irrespective of speed changes, and the lower operating speed of the shaft to the right. Both shafts operate over a 4 to 1 range of variable speeds.

Power is transmitted from a 3-horsepower gearmotor connected through a flexible coupling to the constant speed shaft of an enclosed variable speed transmission, which by the turn of a handwheel, varies the output speed over a 4 to 1 ratio. This variable speed shaft is connected by enclosed chain drive to a totally enclosed bevel gear equipped for both right-angle and straight-through drive.

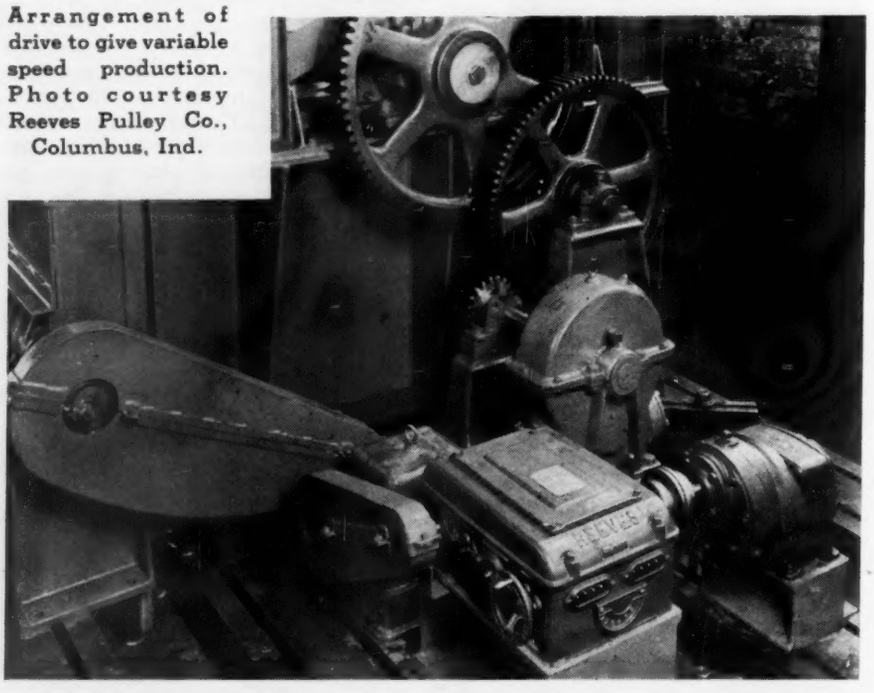
Right-angle output shaft is connected by an enclosed chain drive to the machine shaft at the left providing an overall speed ratio for this shaft varying from 42.1 to 1 to 168.4 to 1, according to the setting of the variable speed unit.

Straight-through shaft of the bevel gear unit is connected by flexible coupling to the worm shaft of 40 to 1 reduction unit.

Worm shaft rides in roller bearings. The worm-gear shaft in turn is connected to two sucessive spur-gear reductions, the last of which, drives machine shaft at the right, providing an ultimate reduction of this shaft from 5780 to 1 to 23,120 to 1. The two machine shafts operate at a constant ratio of approximately 137.3 to 1 over the 4 to 1 speed range.

This high ratio between the two machine shafts is too great to connect the two shafts together except through more elaborate transmission elements than are used and would require a step-up in speed if connected to the main shaft at the right. This interconnection, as complicated as it may seem, is compact and ocupies floor space only 7 x 4 feet 6 inches and is 5 feet high to the top of the final spur-gear drive.

Through the variable speed unit, machine may be operated at any speed within the 4 to 1 limits, thus taking care of any changes in characteristics of the product handled. This drive was installed by the Dominion Engineering Co., Montreal, Que.



Arrangement of drive to give variable speed production. Photo courtesy Reeves Pulley Co., Columbus, Ind.

Extra Pulley Added For Very Light Duty

■ Although extending an extra pulley to the end of a motor shaft is not generally recommended one may be added if subjected to very light duty.

On one machine installation, a small circulating pump was added. Instead of installing a separate motor for this drive, a small pulley 3 inches in diameter for a 1-inch belt was fastened to the end of the motor shaft by drilling and threading a hole in the center of the end of the shaft for a capscrew. A flange on this pulley prevents belt from slipping off on the motor pulley side and getting caught on the motor pulley or key.

When pump is not in use, as when machining cast iron, belt is thrown off the extended pulley. The pump is used only a few months in the year. During the remainder of year the extra pulley is taken off by removing the capscrew. The motor has shown no effects of the extra load.

♦

Where it is necessary to remove and replace an armature from a shop motor, especial care should be taken to protect both new and old armatures when handling between the motor and repair shop. Spare armatures also require careful storage to prevent damage before use.

New Metal Products

■ Toledo Scale Co., Toledo, O., has announced the manufacture of a new parcel post scale with black enamel steel body and a base of cast aluminum. It is of box shape and weighs up to 70 pounds. Built-in illumination and highly legible figures are among the features of the new scale.

♦

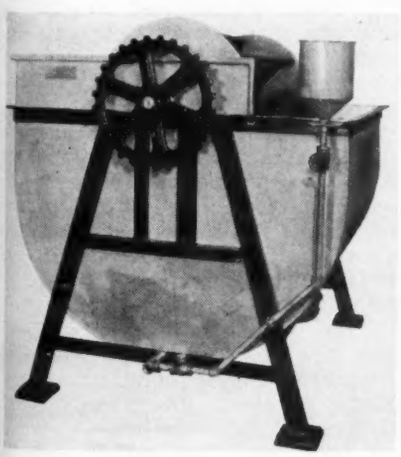
Hunter Steel Co., Pittsburgh, is now marketing structural steel safety railing for bridges, ramps, curves, safety zones and highway and other applications. Structural steel is used for posts and pickets as well as for longitudinal members. Many styles of posts ornamental hand rails, buffers and skirts are available. It is claimed impossible for motor vehicles to crash through the railings.

♦

Coleman Lamp & Stove Co., Wichita, Kans., has announced the Coleman model No. 143 mantle lamp. This new illuminating unit features a nonbreakable fuel fount strongly made of heavy gage brass and metal for safety and long life.

♦

Thomas S. Gassner Co., Philadelphia, has produced a stainless steel rotary hosiery dyeing machine. Supporting frame is of painted steel



and rest of machine is of 18-8 welded construction. Pipes, valves, and other fittings are likewise of stainless steel.

♦

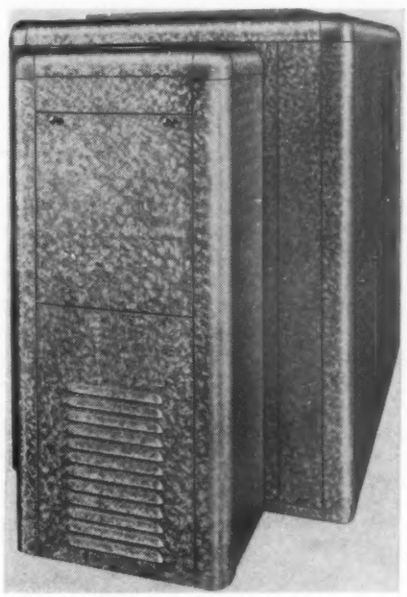
Renown Stove Co., Owosso, Mich., is marketing a small incinerator built for home use. New unit has base and top of heavy cast iron sections and a heavy cast iron grate. Combustion chamber and interior flues are made of heavy gage, heat resisting boiler iron, and exterior case is of heavy steel.

♦

Alaska Freezer Co., Winchendon, Mass., is manufacturing the Triple-Vac freezer with an all metal, vacuum insulated container. Tub is of galvanized ingot iron and copper alloy steel. Also a new product is the Alaska ice cube crusher with tinned hopper and cylinder and a cast iron base.

♦

Holland Furnace Co., Holland, Mich., has added an oil-fired air conditioning unit to its line. New unit is designed for winter or summer air conditioning and combines auto-



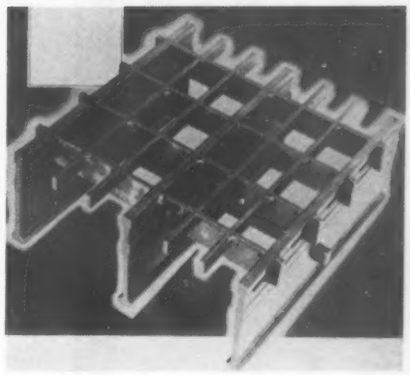
matic oil burner, new type warm air oil furnace and air conditioning equipment in one compact unit. Heating unit is of Hollanized cast metal, resistant to injury from excessive high temperatures, and cabinet construction is heavy gage sheet steel.

♦

S & M Lamp Co., Los Angeles, has as new metal products the recently designed, streamlined, Silverbeam road and fog lights made of cold-rolled steel with a binding trim of brass, chromium plated. The same lights, with chromium instead of black enameled finish, are made entirely of brass. Reflectors are stamped from high quality, heavy gage brass, and the fog light has a special lens said to provide maximum penetration and visibility, preventing blinding "flare-back" from fog, rain, sleet or snow.

♦

Carnegie - Illinois Steel Corp., Pittsburgh, recently developed a new bridge flooring known as I-Beam-Lok Open Floor. The new



flooring consists of special, extra-depth 5-inch beams which form the elementary load-carrying members. Beams are spaced on 6-inch centers, with carrying 1¼ x ½-inch cross bars interecting at 3-inch intervals. Bars in turn are notched at top to receive two additional supplementary cross bars ¾ x ¼-inch, spaced equally between the main carrying beams. Entire assembly produces a steel surface with rectangular openings approximately 1⅝ x 2¾ inches.

♦

Vigor-Aire Corp., Philadelphia, has as a new metal product an automatically-controlled, self-filling humidifier. One machine thoroughly humidifies an average 8 to 10-room house or equivalent office or factory space. Unit fits on top of any convenient radiator and plugs into light socket.

♦

Heiz & Heiz Inc., Brooklyn, N. Y., recently introduced a new all metal, hopper-front package for marketing its nut and bolt hardware. List prices are marked on each package, eliminating necessity for catalog references. Standard size of the

boxes permits convenient stacking on shelves, while hopper front gives easy accessibility. Cost to jobbers is no more than for the products packaged in the old paper cartons.

BY ROBERT E. KINKEAD

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Welding Sacred Calves Should Be Sacrificed

■ The year 1938 will likely be a tough one for stiff necked managers of large welding departments. It will be an extremely good year to break away from old fears and inhibitions.

One is reminded of the analogy in George Kaufman's current success. Grandpa Vanderhoff in advising the young folks to go ahead and have their baby at the expense of their savings account says, "You can't take it with you."

The business conditions and technical status of the welding industry both indicate that 1938 will be a year to build, devise and reconstruct every phase of welding practice. Most of the sacred calves of welding tradition should be sacrificed

Here are some ideas that are widely held and almost universally practiced that need liquidating in the best Stalin manner. That the ultimate speed of welding with the metal electric process is around 3 or 4 pounds of weld metal on the job per hour. That billet scarfing by air tools two or three inches per minute is better than gas scarfing at 40 or 50 feet per minute. That heavy steel plate of merchant ship hulls have to be riveted because welding is too slow. That welding can be done efficiently in some dark corner of the shop with no handling equipment or special facilities. That engineers will do a good job of weld design without experienced help to get them started. That a welding department will remain at high efficiency without some way of checking its performance.

It is no reflection on anyone to recognize the necessity of giving the welding department a thorough overhauling early in 1938. Perhaps the superintendent says he is good, the welding engineer brags that he is doing better than anyone in the industry, the production man says he has costs down to very low levels and that no one can do better, the manager says he has the best welding set-up ever seen in the whole state.

None of these things are true unless the department was given a good going over late in 1937. Thick heavy moss will grow on a welding department faster than on any other department in the plant due to the rapidity with which the field moves. And thick, heavy moss will be very bad for business in 1938.

World Still Contains Much Unused Goodwill

■ In this season of sentiment and reflection when men of all stations meet in the churches of God to pay homage to the spirit of a man of pure heart who was born nearly two thousand years ago, no one can fail to be impressed with the great amount of unused good will in the world today.

Among the leaders of business, government, labor and agriculture the spirit of live and let live is stronger than it has ever been before. Jesus of Nazareth spoke a philosophy which is just now beginning to be believed among men in their week day business of earning a living. No one can be very happy and prosperous unless we all enjoy these things. From an assertion of faith that has become a sound intellectual concept based on experience. The most bitter advocates of class hatred are confounded by the good will of such men as the late Andrew Mellon and the supposedly selfish capitalist Alfred Sloan in giving away millions of dollars for the education of people so they may live better and be better.

Such conflict as exists between government and business leadership arises from difference in methods proposed rather than in the end to be attained. The wildest demands of John L. Lewis as he thunders through his speeches to his followers represent nothing more than Henry Ford has been trying to get for his employes, rather successfully at that, throughout his career as owner of his vast enterprises.

Giant Plow To Reclaim Land

■ **Oxweld Secator cutting machine made by Linde Air Products Co., New York was used with hand cutting blowpipe in shaping this giant 7-ton plow, believed to be the largest in the world, recently built on the Pacific coast. Three 95 horsepower tractors are required to pull the plow which will turn a furrow 4 feet wide and 6 feet deep. This plow will be employed in reclaiming land that has been covered by sand from flood waters**

NEW EQUIPMENT

Gasoline Engine Runs Portable Welder

■ General Electric Co., Schenectady, N. Y., has developed a single-operator, portable welder, combining their improved arc-welding generator and a standard 60-horsepower Ford V-8 engine. This enables welding to be done independently of electric power line service.

Designated as type WD-32BY, welder has a rating of 200 amperes, 40-volt arc, 50-degree rise in 1 hour, and 60 to 200 amperes welding range. Weight of unit is approximately 1250 pounds and can be loaded crosswise into practically any truck, it is claimed.

Features of welder include self-excitation, duplex control and self-stabilization. Standard parts are used both in the engine and generator. By running at the conservative speed of 1750 revolutions per minute ample power is provided. It is claimed that less than 2 gallons of fuel per hour will operate machine at full load. Standard set includes self-starter, battery charging generator, oil-bath air cleaner, fuel pump, ten gallon fuel tank and vacuum speed governor.

Turnlox Removes Fixtures

■ Benjamin Electric Co., Des Plaines, Ill., has announced improvements on its patented Turnlox which now permits reflector and lamp to be quickly and easily cleaned without the use of ladders or the necessity for getting off the floor.

Turnlox removes reflector, globe and lamp from socket with a 90 degree twist. Electrical and mechanical connections are made with socket through a three point, self centering bayonet lock. Socket hoods which receive the detachable reflector units are available in ceiling mount and pendant types. Hoods are fitted with porcelain terminal bases which fit any medium size or mogul base reflector assembly. A light weight shaft and engaging device permits operator, standing on the floor, to safely remove and replace fixtures at heights up to 18 feet, it is claimed.

New Dust Capacitors Made of Welded Steel

■ Westinghouse Electric Co., East Pittsburgh, Pa., is announcing a new line of dust tight capacitators, for use in mills and plants with dust laden atmospheres, to protect live parts from an accumulation of foreign parts. Capacitators consist of 3 parts which include capacitor unit proper, dust terminal compartment and mounting support.

Capacitor unit is the oblong type in a heavy welded sheet steel case with rugged porcelain terminals mounted in case by a sealed process. Bond is made between case and porcelain through medium of metalized platinum coating on the porcelain. Enclosure is designed to mount on unit and sealed with a felt gasket. Felt gasket is also used under the cover which is held down by spring latches. Terminal enclosure contains boric acid and discharge resistors.

Two types of mounting supports are available, one for mounting in an angle iron rack structure, and the other for mounting the unit on the floor. Several capacitors may be placed side by side about 1 inch apart and connected by means of 1½-inch flexible or rigid conduit, using knockout holes. Knockouts are also provided in each end of terminal enclosure for making final connections to the circuit.

Outstanding advantage is terminal cover which is easily removed to take off knockouts. Unit can be removed from terminal enclosure and replaced without disturbing conduit connections. Units are available in 5 and 7½ kilovolt amperes, 230 volt, 60 cycle ratings, and 5, 10, and 15 kilovolt amperes, 460 and 575 volt ratings. Capacitors are also filled with a fluid which will not support combustion or give off gases that support combustion.

Operations Combined On Dual Wheel Carriage

■ Landis Tool Co., Waynesboro, Pa., has introduced a dual wheel carriage type 30 roll grinder which combines two operations on one machine. Machine roughs and finishes rolls.

Roll grinder is 36 x 18 inches and has an extra long rear bed section. On this section are mounted two grinding wheel carriages, one a roll grinder wheel carriage is used for the finishing operation, and the other is a wheel carriage carrying a wheel head utilized for the finishing operation. Due to the length of rear bed section, it is

Roughing spindle of this Landis dual wheel carriage type 30 grinder is 58 inches long and 5¼ inches in diameter. It is driven by means of multiple V-belts from a 100 horsepower motor

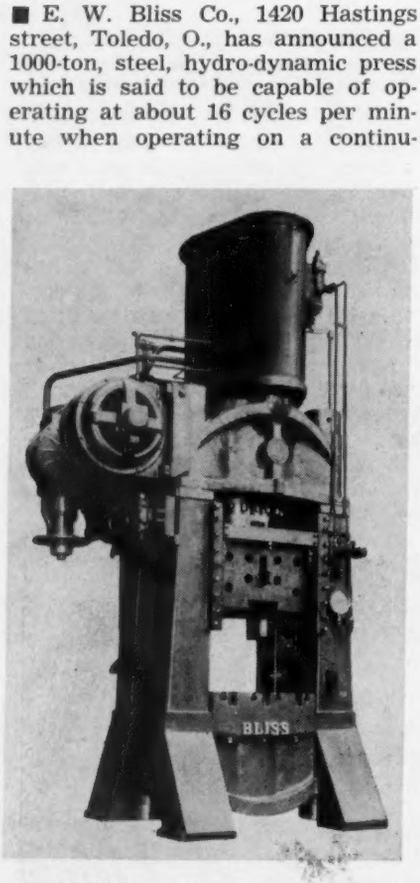
possible to run finishing wheel carriage to end of the roll without interference. Then rough grinding wheel carriage can be run to the opposite end of bed and finish grinding carriage used for final work.

Overall weight of machine is 195,000 pounds utilizing thirteen electric motors. Roughing wheel drive-motor is 100 horsepower. Finishing wheel drive motor is 75 horsepower and work motor 25 horsepower.

It is claimed no dressing is required for roughing wheels as they break down properly during grinding. Another interesting point is roughing wheels can be changed while machine is in the midst of a finishing operation. Motors may be controlled from the wheel carriage. Work motor rheostat is equipped with a motor driven remote control so it can be operated from the operator's platform on the wheel carriage. Wheel carriage motors are interlocked so only one may be used at one time. Dynamic braking eliminates drift of large roughing wheel after motor is stopped. Limit switches to prevent over-travel are also provided.

Hydro-Dynamic Press Has Quick Action

■ E. W. Bliss Co., 1420 Hastings street, Toledo, O., has announced a 1000-ton, steel, hydro-dynamic press which is said to be capable of operating at about 16 cycles per minute when operating on a continuous run with full automatic control.



New 1000-ton Bliss hydro-dynamic press has an intermediate pressing speed of 60 inches per minute on pressure capacities up to 250 tons

Features of press include adjustability of stroke and finger-tip control, side frames keyed to crown, bed adjusted so housing takes any torsional strain and a deep slide guided by long adjustable gibs of standard design. Full electric finger-tip control is also provided, both for production operation and inching, along with speeds forward and high speed return. High speed has an advance of 1100 inches per minute, while intermediate pressing speed advances 60 inches per minute on pressure capacities up to 250 tons. Change of speed is automatically controlled as pressure increases. Change from quick approach to intermediate speed may be governed by position of slide.

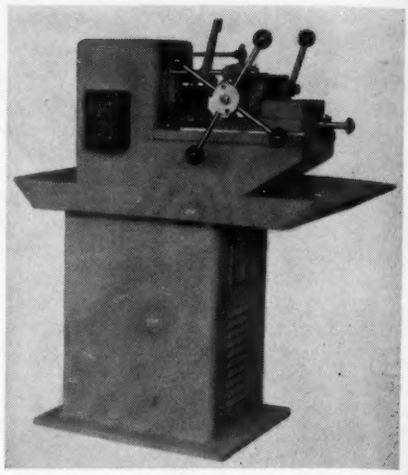
Push button controls emergency stopping in any position of stroke so press cycle can be stopped once started. It may be restarted in either direction. Inching is accomplished by electric push button after selector switch is turned from run to jog position. This control gives the same protection against over-pressure and over-travel as when press is operated continuously. Oil and air filters and oil cooler equipped with thermostatically controlled water inlet valve are included with press.

Duplicate Parts Threaded By Machine

■ Geometric Tool Co., New Haven, Conn., has introduced on the market a completely new No. 14 threading machine which is intended for precision threading of duplicate parts.

This light weight machine cuts standard pitches up to 9/16 inches and fine pitches in larger sizes. Either a die head with conventional milled or tapped chasers, or a die head with tangent or circular chasers may be employed. A wide range of holding devices is a feature of the machine. Standard 2-jawed vise or collet chuck may be used. For simple jobs user can use his own design of holder on machine platen. Both vise and chuck are equipped with an adjustable alignment. Work holder, pivoted on large bolts, can be adjusted both vertically and horizontally without use of gibs or shims.

Illustration shows machine equipped with 2-jawed vise. Back of turnstile is an automatic work gage which gages proper setting of work, then swings out of the way as work is tightened in the vise. Work spindle and drive shaft, made of steel hardened and ground alloys, are mounted on roller bearings. Pick-off change gears permit a wide range of threading speeds desirable when threading different diameters and materials. Unit is driven by a double V belt-drive from motor mounted in the base.



An automatic reversible type pump supplies coolant to this No. 14 Geometric threading machine

Upper Air Diffused

■ Trane Co., La Crosse, Wis., has added to its heater line a light weight, propeller type projection heater which conveys warm upper air of a building down to the floor, diffusing the air stream and carrying it a considerable distance at the same time.

Unit is simply constructed. It has a two-row circular coil mounted between two circular plates. This circular construction is said to take care of normal contraction and expansion. Upper plate is the supporting backbone of the unit. Lower plate provides orifice through which the fan discharges.

Unit is primarily designed for ceiling mountings where it functions best. Warm upper air is drawn through the coils and then projected straight downward to the floor by a 4-blade propeller fan. This air stream induces a large amount of room air in its downward course and reaches the floor zone with the tendency to spread and blanket the floor.

It is said excessive ceiling temperatures are reduced by the heater and a greater uniformity of room temperature is achieved.

Correct Item on Press

■ Among the advantages of the multiple-station press, manufactured by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., and described in the New Equipment section of STEEL, p. 82, December 20, 1937, is the fact that counterbalancing of the gate is *not* necessary and no time is lost in changing the metal coils.

Manufacture of Nuts Is On an Efficient Basis

(*Concluded from Page 46*)

scrap material. This scrap incidentally is sorted 100 per cent, and the buckets, when filled, are transported immediately by the truck up an inclined runway to a point at one end of the depressed freight tracks in the shipping department, where an overhead hoist picks up the bucket and dumps the load into a gondola car for shipment. As much as a car of scrap is loaded in a single day, thus need for large storage space is eliminated.

For general utility service in conjunction with the plant materials handling system, two electric industrial trucks are used. For example, kegs of finished products, all stenciled and dated, are piled four high near the shipping platform. Outgoing shipments are loaded on corrugated steel skids, the latter in turn being picked up by one of the electric trucks and run over heavy steel toe-plates directly into the freight cars.

At one end of the shipping department, shown in Fig. 3, is a recessed loading platform for motor trucks. Like the freight car switch tracks, this recessed space is depressed so that the tail boards of the trucks are on a level with the floor of the shipping platform.

Location of Scales

Weighing and counting scales are used at several points throughout the plant, both the main shipping department and the parcel post mailing room being equipped with them.

In speaking of the importance of materials handling in a modern manufacturing plant, M. L. Douglas, manager of the Coraopolis branch, states:

"More money is lost through poor handling practices than in almost any other direction. After all, the plant transportation system is the co-ordinating force which permits a smooth flow of raw materials to production machines. If you do not control this, your service to customers suffers, and you have many other unsatisfactory accompaniments, including, at times, stoppage of production. We consider it so important that we keep one trained man in charge of plant transportation at all times. He sees that orders are kept on the move. It does not take him long to locate any job going through because each bucket is tagged and all buckets are kept in one section while going from process to process. We have found that our materials handling system has worked in a highly satisfactory manner."

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How Price Control Plans Defeat Their Own Ends

■ *International Raw Commodity Price Control*, cloth, 166 pages, 6 x 9 inches; published by National Industrial Conference Board Inc., New York; supplied by STEEL, Cleveland, for $3.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminister, London, Eng.

National Industrial Conference board has made a study of results of attempts to control prices of raw commodities and conclusions are presented in this volume. It is found that such attempts usually have led to government control of producers. The beginnings have customarily taken the form of emergency measures to meet specific temporary difficulties. Ultimately permanent programs for complete government control under international agreements have been developed. These aspects of changing methods of commodity price control are described in detail.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

For Manual or Motor Operation

• A transfer bridge, crane with hand pushed carrier and chain hoist is one of the many Tramrail units serving this modern steel warehouse.

• These type units completely motorized are also standard equipment.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

n Steel Mills

(*Concluded from Page 54*)

product that is of very best quality.

The billet mill is designed to produce billets from 1¾ to 4 inches. It is designed sufficiently rugged in order to roll wide bars. Edging mill stands are placed in front of No. 1 roll stand and between No. 2 and No. 3 roll stands. In rolling some of the smaller-sized billets, No. 1 edger is used to enter the bloom in No. 1 stand on the diagonal.

The wide-bar mill stands are of extremely sturdy design without caps or bottom adjusting screws. The top roll is held against the screws by a spring hanger arrangement, and adjustment is obtained by means of a worm mechanism on top of the stand. The rolls of this mill are short, having only a 24-inch roll body. The mill is designed to deliver a product 3/16-inch thick and 18 inches wide. Looping between the stands is taken care of by automatic adjusting roller loopers.

Individually Connected

The six stands of this continuous mill are individually connected through the conventional-type spindle, modern and individually lubricated herringbone-type pinions and gear reduction sets to the motors. The continuous mill is preceded by an individually driven swinging crop shear and followed by an electrically-driven, rotary-type, flying shear, designed to give a square cut on billets up to and including 4 inches, varying in length from 12 to 36 feet. This shear is driven by two 100-horsepower, direct-current motors and is synchronized electrically with the finishing stand and is controlled from the pulpit directly above it.

The runout tables from the flying shear have variable speeds in order that they may be controlled and synchronized with the speed of the shear itself. These runout tables deliver the billets to a skew table just preceding two 30-foot cooling beds which are 60 feet long and extend from the main mill building into the cooling bed building. Between the beds an up-and-down-cut billet shear, quite similar to the crop shear, has been provided in order to cut lengths shorter than 12 feet. This shear is driven by a 150-horsepower, alternating current motor and has capacity of 80 square inches.

It is possible to deliver a bar from the cooling bed tables directly into a pinch roll and bar piler. The bars are taken from the bar piler with a remote-control, 15-ton, 37-foot span crane to the cooling bed which is located in the cooling bed building.

All newly installed tables are provided with roller bearings and are equipped with oil-filtering and grease-lubricating systems.

In the extension to the main mill building is a 15-ton, high-speed crane, having roller bearings and individual lubricating system. The cooling bed building is also provided with a 15-ton crane running parallel to the cranes in the main mill building.

Provisions have been made for descaling by the installation of a 1000-pound pressure system. This system is also used to wash scale under the 32-inch mill and the 21-inch continuous mill. The scale system consists of two 1500-gallons per minute, 500-pound pressure pumps running in series making 1000-pound pressure for descaling and 500-pound pressure for washing scale.

Motors of the continuous mill and 32-inch bloomer are housed in separate rooms of modern design with air-cleaning equipment. These motor rooms are serviced by a 60-ton crane on a continuous runway connecting the two rooms. Between the motor rooms is a scale pit for the newly constructed units. The 60-ton crane has an auxiliary 10-ton hoist which is used for loading scale from scale pit.

Construction of the addition also included some relocation and additions to the roll shop of this mill to take care of additional lathe equipment for turning rolls for the new units.

The telautograph system, in use for some years, was extended throughout the newer part of the mill, making possible instantaneous communication between the clerks at finishing end of the mill and the rollers and steel chargers.

With completion of these new units a greater range of products has been made possible. Blooms up to 12 x 12 inches and slabs up to 30 inches in width may be rolled and sheared in the new setup. Longer billets up to 30 feet in length may be rolled and hot-sawed.

The 21-inch continuous mill makes possible rolling of billets from 1¾ to 3 inches square, in varying lengths up to 30 feet. It is possible to roll on this mill flats from 3/16 to 1½ inches thick and up to 24 inches in width. This diversification in size of billets has permitted rolling of more suitable billets for the existing merchant mills in order that they may meet the exacting requirements of the trade.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Monel, Nickel, Inconel—International Nickel Co. Inc., 67 Wall street, New York, has released its fourth quarter publication describing more uses of monel, nickel and inconel in the forms of fire sprinklers, flooring, motors and springs. It is entitled, "Mechanical Topics."

Insulations — Quigley Co. Inc., 56 West Forty-fifth street, New York, has issued bulletin 198 describing Insulbrix. This development combines the advantages of a refractory for service temperatures up to 3000 degrees Fahr. and an efficient heat insulator of low heat storage capacity, which is vitally important in reducing B.t.u. radiation losses from the outer walls and reducing time and fuel necessary to heat up furnaces.

Electrical Heating — Wirtschaftsgruppe Elektrizitatsversorgung, Einemstrasze 1, Berlin W 62, Germany, has issued Parts 2 and 3 of its treatise on "Elektro-Warme". Part 2 is devoted to industrial applications and contains much fundamental data relating to electrical heating, heat treating and melting in the metal producing and metalworking industries. Part 1 is a complete list of electrical heating applications.

Electrical Heating — Wirtschaftsgruppe Elektrizitatsversorgung, Einemstrasze 1, Berlin W 62, Germany, has issued "Elektrowarmetagung Berlin— 5 Juni, 1936", a 102-page, illustrated, 8¼ x 11½-inch volume covering proceedings at the convention, held in Berlin in June of 1936, devoted to all forms of electrical heating. The book, in effect, is a complete description, as of that time, of German equipment and methods of utilizing electricity for heating, heat treating, melting and other related applications.

Steel Market Develops Moderate Upturn

Ship Tonnage Large; Scrap Rises Further; Export Demand Aids

MARKET IN TABLOID

DEMAND . . . *Slightly above December rate.*

PRICES . . . . . *Firm on all mill products.*

PRODUCTION . . *Operating rate gains 5 points to 26 per cent.*

SHIPMENTS . . . *Light, but buyers ask prompt delivery.*

■ MODERATE upturn in steel activity has followed the turn of the year, sufficient business coming in to make possible better rolling schedules. However, a spirit of caution prevails and buying is mainly for immediate needs.

Increased production results from accumulations of orders over the holidays and also from light current buying to fill in gaps in inventories.

New ship tonnage has been awarded and shipbuilders will have some 60,000 tons of steel, principally plates, to place with mills in the next few months, for 12 tankers for Standard Oil of New Jersey. The maritime commission pays part of the cost, to cover additional equipment to make the craft naval auxiliaries. Twelve cargo ships, requiring about 50,000 tons of steel are pending and steel for two battleships now on the ways will come out from time to time. Bids have been taken on about 13,696 tons of armor plate.

Pipe tonnage offers some features, the Texas Co. dividing about 24,000 tons of electric welded line pipe between three producers. The pipe is for use in Colombia, South America. A line 1350 miles long, from Texas to Iowa, has been surveyed.

Resumption of operations after holiday interruptions brought a steelmaking rate of 26 per cent last week, 5 points higher than the preceding week and on a level with the middle of December. Schedules for this week indicate further activity. Pittsburgh gained 10.5 points to 25.5 per cent, Chicago 2 to 24.5 per cent, eastern Pennsylvania 1 point to 31, Youngstown 10 to 24, Wheeling 7 points to 26, Cleveland 8 to 26, Buffalo 7 to 23, and St. Louis 9 to 21. No change was made at Birmingham, 63 per cent, New England 19 per cent, and Detroit 33 per cent. In the Cincinnati district all open hearths were idle, but 30 per cent operation is indicated for this week.

Steel ingot production in December was 1,472,241 gross tons, the lowest in 39 months and 32 per cent lower than in November. Despite this shrinkage in the closing months of 1937 total ingot production for the year was 49,507,766 tons, the third highest year in history. Only 1928 and 1929 production exceeded last year.

Although pig iron production in December at 1,503,474 tons was 25.1 per cent less than in November and the daily rate was 27.5 per cent lower, total output for 1937 was the highest for any year since 1929. The December figures were the lowest for any month since January, 1935. The total output for 1937 was 36,709,139 tons, compared with 42,270,183 tons in 1929. In comparison with the total of 30,682,704 tons made in 1936 the gain was 19.6 per cent.

Automobile assemblies continued at a slow pace although slightly improved over the holiday week. Total output was 54,084, against 49,550 the preceding period. General Motors built 22,425, compared with 19,325 the week before; Ford's output was 22,765, compared with 23,715 in the holiday week; Chrysler, closed over the holidays, reopened to produce 2750 units. All other builders made 6144, against 6510 in the preceding period.

November steel exports of 301,280 gross tons were 10.6 per cent less than October total, smaller pig iron shipments accounting for most of the loss. For 11 months exports continued to exceed the similar period in 1936 and also in 1929. Tin plate exports through November were larger than for all of 1929 and the November total was the largest month in history. Imports for November were somewhat less than in October.

Strength in scrap in eastern markets has caused STEEL's composite of steelmaking scrap to advance 8 cents, to $13.83, the sixth consecutive weekly increase. This is $1.08 higher than the low point at the end of November. The iron and steel composite is advanced 1 cent, to $38.93. The finished steel average is unchanged at $61.70.

Copper and lead last week made the first advances in months, the former gaining 3/8c to the basis of 10.50c, Connecticut, and the latter $2 per ton to 4.85c, New York. This break in the continuous decline of many weeks is regarded as significant.

COMPOSITE MARKET AVERAGES

	Jan. 8	Jan. 1	Dec. 25	One Month Ago Dec., 1937	Three Months Ago Oct., 1937	One Year Ago Jan., 1937	Five Years Ago Jan., 1933
Iron and Steel....	$38.93	$38.92	$38.90	$38.88	$39.59	$36.55	$28.17
Finished Steel	61.70	61.70	61.70	61.70	61.70	55.80	46.13
Steelworks Scrap..	13.83	13.75	13.58	13.24	15.93	18.12	6.23

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Jan. 8, 1938	Dec. 1937	Oct. 1937	Jan. 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.20c
Steel bars, Chicago	2.50	2.50	2.50	2.25
Steel bars, Philadelphia	2.74	2.75	2.74	2.49
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.10
Shapes, Pittsburgh	2.25	2.25	2.25	2.05
Shapes, Philadelphia	2.45½	2.46½	2.45½	2.25½
Shapes, Chicago	2.30	2.30	2.30	2.10
Tank plates, Pittsburgh	2.25	2.25	2.25	2.05
Tank plates, Philadelphia	2.43½	2.44½	2.43½	2.23½
Tank plates, Chicago	2.30	2.30	2.30	2.10
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.15
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.80
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.40
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$34.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	34.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	43.00

Pig Iron

	Jan. 8, 1938	Dec. 1937	Oct. 1937	Jan. 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$22.31
Basic, Valley	23.50	23.50	23.50	20.50
Basic, eastern del. East. Pa.	25.26	25.34	25.26	22.26
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	22.21
No. 2 fdy., Chicago	24.00	24.00	24.00	21.00
Southern No. 2, Birmingham	20.38	20.38	20.38	17.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.69	20.69
No. 2X eastern, del. Phila.	26.135	26.21½	26.13½	23.13½
Malleable, Valley	24.00	24.00	24.00	21.00
Malleable, Chicago	24.00	24.00	24.00	21.00
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.04	26.54
Gray forge, del. Pittsburgh	24.17	24.17	24.17	21.17
Ferromanganese, del. Pittsburgh	107.49	107.49	107.29	84.79

Scrap

Heavy melting steel, Pittsburgh	$13.75	$13.40	$17.15	$18.95
Heavy melt. steel, No. 2, E. Pa.	13.50	13.13	14.01	16.40
Heavy melting steel, Chicago	13.25	12.50	13.95	18.25
Rails for rolling, Chicago	14.25	14.25	17.25	19.40
Railroad steel specialties, Chicago	15.75	15.75	19.35	19.65

Coke

Connellsville, furnace, ovens	$4.25	$4.37	$4.45	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	10.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.96c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.81c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.41c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.31c
Philadelphia, del.	3.40c
New York, del.	3.44c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.71c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.76c
Philadelphia, del	3.85c
New York, del.	3.89c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.81c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.01c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.85c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young....	2.35c
Gulf ports	2.70c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring 0.15
6100 bars 1.20
6100 spring 0.85
Cr. N., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/8-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/16-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
⅜	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

Sizes	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 11/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25c; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	....	....	....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	....	24.50	....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	....	24.66	....
Boston from Birmingham	26.57	....	26.07	....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethlehem	27.47	27.97	....	....
Brooklyn, N. Y., from Bmghm.	27.25	....	....	....
Canton, O., fom Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	....	24.30	....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	....
Cincinnati from Birmingham	23.89	....	22.89	....
Cleveland from Birmingham	24.32	....	23.82	....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	....	....	....
Newark, N. J., from Bethlehem	26.53	27.03	....	....
Philadelphia from Birmingham	25.58	....	25.46	....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	....
Pittsburgh district from Neville Island	∫ Neville, base plus 63c, 76c,) and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	....
St. Louis from Birmingham	†24.12	....	23.82	....
St. Paul from Duluth	26.08	26.08	....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phila. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	2.00-2.25
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Future	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Dec. 31	10.12½	11.12½	9.65	41.00	41.00	4.75	4.60	5.00	20.00	13.75	35.00
Jan. 3	10.12½	11.12½	9.65	41.12½	41.12½	4.75	4.60	5.00	20.00	13.75	35.00
Jan. 4	10.12½	11.12½	9.65	41.62½	41.62½	4.75	4.60	5.00	20.00	13.75	35.00
Jan. 5	10.25	11.12½	9.77½	42.00	42.00	4.75	4.60	5.00	20.00	13.75	35.00
Jan. 6	10.25	11.12½	9.77½	41.87½	41.87½	4.75	4.60	5.00	20.00	13.75	35.00
Jan. 7	10.50	11.12½	10.02½	42.00	42.00	4.85	4.70	5.00	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.00c *Conn. copper*

Sheets

Yellow brass (high)	17.37½
Copper, hot rolled	19.12½
Lead, cut to jobbers	8.25
Zinc, 100-lb. base	10.00

Tubes

High, yellow brass	20.12½
Seamless copper	19.87½

Rods

High yellow brass	13.37½
Copper, hot rolled	15.62½

Anodes

Copper, untrimmed	16.37½

Wire

Yellow brass (high)	17.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	6.12½-6.37½
Cleveland	6.25-6.50
*Chicago	6.00-6.25
*St. Louis	6.00-6.25

Heavy Copper and Wire

*New York, No. 1	7.75-8.00
*Cleveland, No. 1	7.75-8.00
*Chicago, No. 1	7.62½-7.87½
*St. Louis	7.62½-7.87½

Composition Brass Borings

*New York	5.12½-5.37½

Light Copper

*New York	5.75-6.00
*Cleveland	5.75-6.00
*Chicago	5.50-5.75
*St. Louis	5.50-5.75

Light Brass

*Cleveland	3.50-3.75
Chicago	3.62½-3.87½
St. Louis	3.25-3.75

Lead

New York	3.50-3.75
Cleveland	3.25-3.50
Chicago	3.50-3.75
St. Louis	3.25-3.50

Zinc

New York	2.12½-2.25
*Cleveland	2.00-2.25
St. Louis	2.25-2.50

Aluminum

Borings, Cleveland	6.75-7.00
Mixed cast, Cleve.	9.75-10.00
Clips, soft, Cleve.	11.75-12.00
Mixed cast, St. L.	9.25-9.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl.	11.25
Stand. No. 12 alum.	17.00-17.50

WAREHOUSE IRON AND STEEL PRICES

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Birmingham	3.85c
Boston††	4.05c
Buffalo	3.90c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York‡ (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York‡ (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c

REINFORCING BARS

Buffalo	3.10c
Birmingham	3.85c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.92c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Birmingham	3.75c
Boston††	3.93c
Buffalo	3.80c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleve., ¼-in., o'r	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York‡ (d)	4.00c
Philadelphia	3.90c
Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Birmingham	3.80c
Boston (g)	4.00c
Buffalo, 8-10 ga.	3.97c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York‡ (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Birmingham	4.55c
Boston (g)	4.75c
Buffalo	4.80c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York‡ (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Birmingham	5.20c
Buffalo	5.45c
Boston (g)	4.85c
Chattanooga*	4.66c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
N. Y. ov. 10 bd.	5.00c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Birmingham	4.05c
Boston††	4.25c
Buffalo	4.22c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅜ & Und.	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York‡ (d)	4.32c
Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	4.22c
Chicago	4.10c
Cincinnati	4.25c
Detroit, 14 & Und.	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York‡ (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Birmingham	4.91c
Boston*	4.65c
Buffalo (h)	4.35c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c
New York‡ (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.79c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York‡ (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

	Base
High speed	80c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening	12½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Birmingham	50-10
Chicago (a)	55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	60 to 65
New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add $1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with $1 minimum invoice.

‡Domestic steel; *Plus quantity extras; **One to 9 bundles; *† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 6

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$30.00 6 0 0	$19.50	2 9 0
Basic bessemer	.....	20.80	2 12 0
Hematite, Phos. .03-.05	26.25 7 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$39.38 7 17 6	$43.01	5 7 6
Wire rods, No. 5 gage	56.38 11 5 6	48.00	6 0 0
FINISHED STEEL			
Standard rails	$50.63 10 2 6	$46.00	5 15 0
Merchant bars	2.73c 12 5 0	2.17c	6 0 0
Structural shapes	2.37c 10 12 6	1.94c	5 7 6
Plates, ††¼ in. or 5 mm.	2.58c 11 11 3	2.59c	7 2 6
Sheets, black, 24 gage or 0.5 mm	3.34c 15 0 0	3.18c	8 15 0††
Sheets, gal., 24 gage, corr.	3.96c 17 15 0	3.91c	10 16 0
Bands and strips	3.07c 13 15 0	2.17c	6 0 0
Plair wire, base	4.35c 19 10 0	2.42c	6 17 6
Galvanized wire, base	5.18c 23 5 0	3.18c	8 15 0
Wire nails, base	4.13c 18 10 0	2.90c	8 0 0
Tin plate, box 108 lbs.	$ 5.63 1 2 6	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$26.50	5 6 0(a)	$18.84	554	$25.43	750	$25.38	63
Basic bessemer pig iron	25.00	5 0 0(a)	.....	.....	.....	.....	28.00 (b)	69.50
Furnace coke	9.38	1 17 6	6.43	189	7.29	215	7.66	19
Billets	39.38	7 17 6	28.56	840	32.54	960	38.88	96.50
Standard rails	2.26c	10 2 6	17.30c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.55c	11 9 0	1.62c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.46c	11 0 6	1.58c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.61c	11 14 3	2.03c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.51c	15 15 0§	2.35c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	4.35c	19 10 0	3.30c	2,200	4.50c	3,000	6.66c	370
Plain wire	4.35c	19 10 0	2.49c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.72c	12 4 0	1.82c	1,210	2.33c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. del. Middlesbrough. b hematite. ††Close annealed.
**Gold pound sterling carries a premium of 64.41 per cent over paper sterling.

—The Market Week—

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	10.00
Birmingham, No. 2.	9.00
Bos. dock No. 1 exp.	14.00
N. Eng. del. No. 1..	13.50
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	13.00-13.50
Cleveland, No. 1 ..	12.50-13.00
Cleveland, No. 2 ...	11.50-12.00
Detroit, No. 1	9.50-10.00
Eastern Pa., No. 1..	15.00
Eastern Pa., No. 2..	13.50
Federal, Ill.	11.50-12.00
Granite City, R. R..	13.00-13.50
Granite City, No. 2.	11.50-12.00
† Los Angeles, No. 1	8.00- 8.50
New York, No. 1....	†11.00
N. Y. dock No. 1 exp.	13.50
Pitts., No. 1 (R. R.)	15.25-15.50
Pitts., No. 1 (dlr.)..	13.50-14.00
Pittsburgh, No. 2...	12.00-12.50
St. Louis, R. R....	13.00-13.50
St. Louis, No. 2....	11.50-12.00
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Toronto, dlrs. No. 1	10.00
Toronto, No. 2	9.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers....	12.00-12.50
Chicago, factory ..	11.50-12.00
Chicago, dealer	10.50-11.00
Cleveland	12.00-12.50
Detroit	10.25-10.75
E. Pa., new mat. ..	15.00
E. Pa., old mat.	10.50-11.00
Pittsburgh	14.00-14.50
St. Louis	7.25- 7.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	10.00-10.50
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Pittsburgh	13.00-13.50
St. Louis	6.75- 7.00
Toronto, dealers ...	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.00- 6.50
Detroit	7.00- 7.50
† Los Angeles	4.00
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	18.00-18.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Pitts., 3 ft. and less	17.50-18.00
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	13.00-13.50
Cleveland	16.50-17.00
Pittsburgh	15.00-15.50
St. Louis	13.50-14.00
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	13.00-13.50
Chicago, net	8.50- 9.00
Cincinnati, dealers..	5.50- 6.00
Detroit, net	8.50- 9.00
Eastern Pa.	13.00-13.50
New York, fdry.	†8.50- 9.00
St. Louis	9.00- 9.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	18.00-18.50
Chicago, coil	17.00-17.50
Chicago, leaf	15.50-16.00
Eastern Pa.	18.00-18.50
Pittsburgh	18.00-18.50
St. Louis	15.00-15.50

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	17.50-18.00
Cleveland, crops ...	19.50-20.50
Eastern Pa., crops..	19.00-19.50
Pittsburgh, crops...	18.00-19.00

FROGS, SWITCHES

Chicago	13.00-13.50
St. Louis, cut	13.50-14.00

SHOVELING STEEL

Federal, Ill.	11.00-11.50
Granite City, Ill. ..	11.00-11.50
Toronto, dealers....	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net..	10.00-10.50
Cincinnati, No. 2...	9.50-10.00
Eastern Pa., No. 1..	15.50-16.00
St. Louis, No. 1 ...	9.00- 9.50
St. Louis, No. 2....	13.00-13.50
Toronto, No. 1 dlr..	16.00

SPECIFICATION PIPE

Eastern Pa.	13.50-14.00
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	11.50-12.00
Cincin., No. 1, deal..	8.50- 9.00
Cincinnati, No. 2...	3.00- 3.50
Cleveland, No. 2 ..	8.50- 9.00
Detroit, No. 1, new.	9.50-10.00
Valleys, new, No. 1	12.50-13.00
Toronto, dealers....	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	7.00- 7.50
Chicago	6.50- 7.00
Cincinnati, dealers..	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	8.50- 9.00
New York	†5.00- 5.50
Pittsburgh	7.00- 7.50
St. Louis	5.00- 5.50
Toronto, dealers....	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.50
Buffalo	7.00- 7.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
Eastern Pa.	8.00- 8.50
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers....	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem...	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	7.00- 7.50
Chicago	6.00- 6.50
Cincinnati, dealers..	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
E. Pa., chemical....	13.50-14.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers....	7.50

PIPE AND FLUES

Cincinnati, dealers..	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.50-10.00
Chicago, net	8.50- 9.00
Cincinnati	5.50- 6.00
Eastern Pa.	13.00-13.50
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†6.50
Buffalo	12.00- 12.50
Cleveland	11.00- 11.50
Detroit	9.00- 9.50
Pittsburgh	12.50-13.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	15.50-16.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.50-13.00
Chicago, elec. fur...	11.50-12.00
Eastern Pa.	13.00-13.50
St. Louis	9.50-10.00
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	18.00-18.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	20.50-21.50
St. Louis	18.50-19.00

SHAFTING

Boston district	†15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron...	†10.00
Buffalo, steel	17.50-18.00
Chicago, iron	15.00-15.50
Chicago rolled steel	15.00-15.50
Cincinnati, iron	15.00-15.50
Eastern Pa., iron..	16.50-17.00
Eastern Pa., steel..	18.00-18.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel...	18.00-18.50
St. Louis, iron	14.00-14.50
St. Louis, steel	15.50-16.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2..	12.00
N. Eng. del. textile.	15.50-16.00
Buffalo, cupola ...	14.00-14.50
Buffalo, mach.	15.00-15.50
Chicago, agri. net..	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net.	12.50-13.00
Cincin., mach. cup...	10.50-11.00
Cleveland, mach....	17.00-17.50
Eastern Pa., cupola.	16.00-16.50
E. Pa., mixed yard..	14.00-14.50
Pittsburgh cupola..	16.00-16.50
San Francisco, del..	13.50-14.00
Seattle	8.00
St. Louis, No. 1 ...	12.00-12.50
St. L., No. 1, mach.	12.50-13.00
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break..	†9.25
N. Eng., del.	12.50-13.00
Buffalo, break	11.50-12.00
Cleveland, break....	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net...	12.50-13.00
Eastern Pa.	14.00-14.50
New York, break. ..	†10.50-11.00
Pittsburgh	13.00-13.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	16.00
Buffalo	14.00-14.50
Chicago, R. R.	14.50-15.00
Cincin., agri. del...	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R. ..	16.50-17.50
Pittsburgh, rail	13.75-14.25
St. Louis, R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	14.00-14.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	14.00-14.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	14.75-15.25

LOW PHOS. PUNCHINGS

Buffalo	17.50-18.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
Pittsburgh (heavy).	17.50-18.00
Pittsburgh (light)..	14.00-14.50
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	nominal
Swedish low phos...	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom..	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f..	$25.50-26.50

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%.. ..... non.	45.00
So. African, 50-52% ..... non.	45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 72

Pittsburgh—Inquiries for sheets again are appearing for the first time in months, and cover a wide variety of miscellaneous sources. A fair number include sheet specialties and galvanized. Makers of electrical sheets seem to be fairly busy, there being less of the seasonal factor in that branch of the trade. While auto partsmakers in general still appear reluctant to make further commitments there are a few exceptions among builders of moderate priced cars. Agricultural implement builders, facing immediately a promising manufacturing season based upon expected demand in the spring from financially reinforced farm interests, are likely to be in the market from this time forward.

Sheet mill operations are believed to have reached the low point this week at about 19 per cent of capacity against 21 per cent last week for common black, and 20 per cent for galvanized this week compared with 24 per cent last week.

Cleveland — The expected slight improvement in specifications of hot and cold-rolled sheets has failed to materialize. Consumers continue to order only for actual requirements as their own operations continue at the low levels reported during December. While inventories are at low levels in many instances, they are still proportionally high when contrasted with current requirements. Absence of demand from local stamping concerns serving the auto industry is an important factor in present local market.

Chicago — Gains in sheet demand are small and this market retains the quiet status which has marked recent weeks. Automotive buying is light and while most other consumers have only moderate inventories, the restricted rate of consumption is dictating the placing of small orders covering immediate needs. Sheet demand from farm equipment manufacturers is less active though still fairly heavy for this period. Tin plate demand also is dull, this commodity being in its slowest period of the year.

Boston—Improvement in sheet buying is spotty, there being some gain in scattered fill-in orders for early shipment, but no sustained upturn in demand. Jobbers in some instances are patching up stocks of some finishes with indications that warehouses as a rule will carry somewhat lighter supplies until industrial consumption improves. Requirements for refrigerators are slightly heavier, but most stamping and forming shops are not active buyers.

New York — Relatively mild weather has resulted in a better movement of galvanized sheets than was generally anticipated earlier in the season. Manufacturers of electric refrigerators, who are building up stocks for the spring trade, are releasing an increasing amount of tonnage, although their requirements at this time will not run as heavy as in recent years, it appears. Deliveries are still available within a week to two weeks on most items.

Philadelphia — No perceptible lift has developed in demand for sheets. Last week many consumers still were engaged in inventory taking and were not interested in making additional commitments. As the current week opens, sheet sellers have assurance that first quarter requirements will be placed soon by some consumers. No rapid expansion in demand is seen, however, from major consumers in the immediate future. Stove and radio makers, for instance, are overstocked on finished products and the auto parts trade is slack, except for those with Ford work.

Cincinnati — Buying of sheets has improved moderately over fourth quarter. Individual orders tend to be smaller than normal, as users seek to avoid excessive inventory. Some customers, well stocked in the last few months, are purchasing again.

St. Louis—During the past several days there has been some improvement in ordering of sheets, principally from miscellaneous users. Light buying during the past several weeks has resulted in reduced consumer stocks, but requirements are being filled on a hand-to-mouth basis, little interest being displayed in distant needs.

Birmingham, Ala. — Mills report some increase in bookings of sheets after a considerable recession that set in several weeks before the holidays. While the gain has not been quite up to expectations, it is sufficient to better balance current output with shipments.

Strip

Strip Prices, Page 73

Cleveland — Specifications for wide and narrow strip are substantially unchanged from the latter part of December. Most consumers have ample stocks for current requirements and are in no hurry to build up inventories to former levels. Operations among many local partsmakers supplying the auto industry continue at the low levels of the past few weeks. Electrical equipment and small tool manufacturers have also failed to show any increased activity.

Pittsburgh—Makers of medium and narrow widths of strip are awaiting relief from the present low state of the trade. At present, hot strip operations are around 14 per cent of capacity, against 16 per cent in the preceding week, and cold strip mills are operating at 17 per cent, against 19 per cent in the preceding week.

Chicago — Strip demand has shown little change despite some recovery from the depressed state of buying during the holiday period. Practically all types of consumers are running at less than the normal rate for this period, though fair business is coming from the farm equipment industry.

Boston — Although narrow cold strip buying has not materially improved, producers confidently expect a mild upturn in specifications later this month. Since the turn of the year, however, little gain in incoming volume is noted. Buying is expected to follow closely actual consuming needs with little inventory purchasing. Current volume is made up of well diversified small orders for prompt shipment.

New York — The general situation covering narrow cold and hot strip is unchanged. Demand is still light, with producers hopefully looking for some improvement within the next two or three weeks. While consumer inventories are down, buying in the immediate future is expected to follow closely production of consumer goods taking strip.

Philadelphia — Sellers of narrow strip in both hot and cold-rolled specifications expect some improvement over the next two or three weeks. Some business is pending from consumers out of the market since the advance in prices last year. Prices remain steady.

Plates

Plate Prices, Page 72

New York—One of the largest steel contracts in terms of dollars, close to $8,000,000, is involved in the inquiry for armor plate, bids on 13,696 tons being taken by the bureau of ordnance, navy department, Dec. 29. Low bids on the 20 items included in the inquiry ranged from $555 to $605 per ton. Three producers quoted, with no identical bids. Material is for battleships now under construction at Brooklyn and Philadelphia, class A armor being required in most of the tonnage.

Bethlehem Steel Co., Bethlehem,

Pa., is low on 8940 tons; Midvale Company, Philadelphia, 3012 tons, and Carnegie-Illinois Steel Corp., Pittsburgh, 1744 tons.

Approximately 40,000 tons of plates will be required for the 12 tankers recently placed by the Standard Oil Co. of New Jersey, three each going to the Newport News Shipbuilding & Dry Dock Co., New port News, Va., the Sun Shipbuilding & Dry Dock Co., Chester, Pa.; the Bethlehem Shipbuilding Corp., Baltimore, and the Federal Shipbuilding & Dry Dock Co., Kearny, N. J. In addition, hull steel for these boats will take 20,000 tons of shapes and bars.

This tonnage along with additional work for the navy and requirements for the 1100 miscellaneous freight cars on which bids are to be opened Jan. 10 by the Western Maryland railroad are the principal interest of platemakers. Miscellaneous specifications are expected to show some improvement this month.

In the export field, American platemakers have put in bids on approximately 4000 tons on which the South African Railways & Harbors open bids Jan. 17. Several scattered inquiries, involving lots of 100 tons or so are being figured for Norway and also 200 tons for gas holders for England. However, foreign offering prices have now reached the point where American producers are becoming less interested. One offering, for instance, involving only a modest tonnage, works back to about 1.83c, eastern mill, and still lower on the Pittsburgh basis. Little plate tonnage is now on inquiry from Japan.

Boston—Plate buying continues light, most orders being for miscellaneous needs, less than car lots for prompt delivery. Inventories are smaller, but numerous consumers are holding off new commitments until their own business improves. Railroads have covered on routine quarter requirements, but specifications this quarter will be light, with most repair shops either down or curtailing operations.

Philadelphia — Plates for the two navy tenders placed with a Camden, N. J., yard have been allocated to an Ohio and an Eastern Pennsylvania mill, it is reported. Interest continues in disposition of 60,000 tons of steel required for 12 Standard Oil tankers. Miscellaneous plate demand so far has failed to show improvement. Some foreign business is noted at quotations under domestic levels.

Cleveland — City of Cleveland issued inquiries on 650 tons of 36-inch steel pipe for a water main project from Parma reservoir to Rocky River. This represents only a portion of the total estimated requirement of 3000 tons, the balance of which is expected to appear within the next few months. Considerable plate tonnage will also be required for 25 covered hopper freight cars of 70-ton capacity for the Chesapeake & Ohio railroad on which bids are due some time late this month.

Chicago — Plate business still is suffering from inactive railroad equipment building. Outlook for plate consumption in heavy fabricated works is uncertain though fair demand from the oil industry is presaged by substantial appropriations for equipment. Plate shipments to railroad shops for repair work are light. The Burlington railroad is expected to release material soon for 1250 freight cars to be built in its own shops. Plate deliveries continue one week to ten days.

Seattle — The largest contract pending in this area involves 12,000 tons or more required for 18 large penstocks for Coulee dam, bids opened by bureau of reclamation, Denver, Jan. 6. Fabrication will be necessary on the job, where a rolling mill will be erected.

Plate Contracts Placed

100 tons, water tank, Williamson, Mich., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Unstated tonnage, 150,000-gallon elevated water tank, Roxton, Tex., to Taylor Iron Works, Macon, Ga.

Plate Contracts Pending

13,696 tons, armor plate, bureau of ordnance, navy department, Washington, for delivery Brooklyn and Philadelphia, schedule 200, bids Dec. 29; Bethlehem Steel Co., Bethlehem, Pa. low on 8940 tons; Midvale Company, Philadelphia, 3012 tons, and Carnegie-Illinois Steel Corp., Pittsburgh, 1744 tons. Bids were not identical on any item and ranged from $555 to $605 per ton as low.

8273 tons, penstocks for second unit Coulee dam, Washington; Western Pipe & Steel Co. of California, San Francisco, low, at $1,456,624; bids Jan. 6.

100 tons, 200,000-gallon elevated steel water tank, contract 2, Milford, Del., Pittsburgh-Des Moines Steel Co., Pittsburgh, low $30,560, bids Dec. 28 to Charles E. Banning, city manager.

Unstated tonnage, water tank and tower, Waverly, Ill., to Chicago Bridge & Iron Co., Chicago, $7090, bids Dec. 4.

Bars

Bar Prices, Page 72

Pittsburgh—Some new business in common steel bars, booked previously on the basis of delivery after the New Year, has led to resumption of several bar mills after the holiday shutdown. However, unless further increase in specifications appears shortly, it may be impossible to keep these mills operating for longer than a couple of weeks, Belief is that a fair flow of new orders may be expected by the middle, or end of this month.

Cleveland—With absence of demand from local forging concerns serving the auto trade and slight easing in requirements from agricultural equipment manufacturers, sellers have not felt improvement in specifications. Inventories have been depleted to the point where renewed buying will immediately become necessary upon any upturn in consumer operations.

Chicago — Steel bar demand shows little change except for occasional betterment in orders from consumers whose inventories had been permitted to decline sharply over the year-end. Automotive buying continues disappointing and business from farm equipment manufacturers is lagging despite the fact that operations of this industry hold well above the average. Sales continue in small lots for prompt shipment.

Boston—Republic Steel Corp., Cleveland, has been awarded 200,000 pounds, heat-treated steel bars, at 9.005c, delivered, Springfield, Mass., armory. Crucible Steel Co. of America, New York, received the contract for 50,000 pounds, hot-rolled acid manganese steel bars, 5.50c, delivered. Material is for the manufacture of rifle barrels.

Carnegie-Illinois Steel Corp., Pittsburgh, has been awarded 130,800 pounds of nickel bar steel, for the (Charlestown) Boston navy yard at $6368.07, delivered, bids Dec. 14. The same price was quoted by several other sellers.

Industrial demand for all finishes of bars has improved only slightly.

New York — Bar sellers anticipate a slight gain over the remainder of this month, now that the inventory season is nearing an end. Apart, however, from some ship work and the requirements of the 1100 freight cars for Western Maryland, little is in prospect. As a matter of fact, some leading sellers doubt if any action will be taken by the Western Maryland on its list, which opens Jan. 10. Mill deliveries are generally available within a week. Cold-drawn bar business is being sustained principally by requirements of machine tool builders, although specifications from these consumers are lighter than even a month ago.

Philadelphia — Tangible improvement in sentiment is noted among commercial steel bar sellers. Consumer inventories no longer are

burdensome, except perhaps in the case of the warehouse trade, and renewed buying shortly is believed inevitable.

Pipe

Pipe Prices, Page 73

Pittsburgh — Texas Co. has distributed orders for 23,000 to 24,000 tons of electric-welded pipe, 12¾-inch o.d., for 225-mile oil line in Colombia, S. A. Orders were divided between National Tube Co., Jones & Laughlin Steel Corp. and Republic Steel Corp. This is the largest line pipe order placed in many months by oil interests.

Buying of butt and lap welded pipe to replenish depleted stocks following inventory has not started yet but is expected within the next fortnight. Several oil and gas pipe line projects are nearing the point of taking figures but still are considered indefinite.

Additional orders for wrought pipe are coming to mills, leading to the trade conclusion that stocks have been allowed to run too low and also that some considerable expansion in building has progressed to the stage where pipe requirements are forced to the front.

Cleveland — Cast iron pipe inquiries, while still at the low levels of the past month, have shown signs of improving. Cincinnati has taken bids on 602 tons of 4 to 12-inch cast pipe for a water extension program and bids also went in last week on 200 tons for miscellaneous requirements for Toledo, O. Most foundries are still on reduced schedules.

Chicago — An inquiry for 1918 tons of 8 and 12-inch cast iron pipe for Chicago is the principal item of prospective business. Other inquiries generally are small and sales are equally restricted. Proposed purchases by other large cities of the Central West are small and prospects for business hinge largely upon probable installations by smaller municipalities.

Boston—Cast iron buying is light and unfavorable conditions for laying operations in some districts has resulted in a drop in fill-in miscellaneous demand. Merchant steel pipe is also sluggish, due largely to lack of building. There are several attractive inquiries for corrugated galvanized metal pipe, notably for Vermont highways, 15 to 48-inch diameters.

New York — Approximately 700 tons of steel pipe will be required for the 12 Standard Oil tankers on which construction contracts recently have been placed for yards. Bids have been taken and contracts closed on approximately 1000 tons of cast pipe in this immediate territory with 5500 tons for a Virginia project slated to go to the Burlington, N. J., foundry. Miscellaneous buying and new inquiry is down seasonally as municipal purchasing programs are being arranged for the year. Utilities are not active. Donaldson Iron Works, Emaus, Pa., has been awarded 340 tons of cement-lined pipe for New York city.

San Francisco — Awards of cast iron pipe were the largest in over three months and aggregated 1787 tons. This brought the total for 1937 to 31,347 tons as compared with 48,965 tons in 1936 and 61,770 tons for the average during the past sixteen years.

Seattle — Proposed water system improvements are numerous in the Pacific Northwest but many projects await financial arrangements expected to be closed in the first quarter. Bids for 3500 tons involved in the Seattle Volunteer Park-Magnolia extension await sale of bonds for action.

Cast Pipe Placed

340 tons, 12-inch cement-lined delivered borough of Manhattan yard, New York, to Donaldson Iron Works, Emaus, Pa., $55.60 per ton, bids Dec. 29; R. D. Wood & Co., Florence, N. J. awarded approximately 150 tons, low pressure fittings, same opening, department of purchase.

220 tons, 6 to 12-inch, class 150, for Bremerton, Wash., to H. G. Purcell, Seattle, for United States Pipe & Foundry Co., Burlington, N. J.

200 tons, 8 and 12-inch for Spokane, Wash., to unnamed interest.

Cast Pipe Pending

1918 tons, Chicago, including 1425 tons of 8-inch and 493 tons of 12-inch; bids Jan. 14.

913 tons, 4 to 12-inch, La Mesa, Lemon Grove and Spring Valley irrigation district, La Mesa, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

602 tons, 4 to 12-inch, water extension, Cincinnati; bids in.

425 tons, Westchester-Biltmore water project, Mamaroneck, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

254 tons, 4 to 10-inch, Anaheim, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

200 tons, miscellaneous sizes for stock, Toledo, O; bids in.

140 tons, 12-inch, procurement division, treasury department, New York, to Warren Foundry & Pipe Co., Phillipsburg, N. J.

100 tons, 6 to 10-inch, for Pasco, Wash.; bids Jan. 20.

Steel Pipe Pending

650 tons, 36-inch, water main, Cleveland.

Wire

Wire Prices, Page 73

Pittsburgh—New business in a wide line of wire products is being received by mills this week in much larger volume than for several preceding weeks. Some fair sized orders for nails request immediate shipment, as stocks of some distributors are practically wiped out. Pressing inquiries for export include tonnages of rods for England, Greece, Turkey, China and Japan, in lots of 500 to 1000 tons.

Cleveland — Requirements for merchant and manufacturing wire remains at the low levels reported during December. This is primarily due to absence of demand from the automotive industry and unseasonal period for merchant products.

Chicago—Despite occasional small gains in steel wire demand, activity has not assumed a definite upward trend. Improved consumption will be followed promptly by heavier buying, in view of the low state of inventories of most users. Business lately has been almost entirely in small lots for immediate shipment.

Boston—There has been no material gain in wire buying and incoming volume is being shipped without increasing finishing operations, which in some instance are not better than 25 per cent of capacity. Orders are small but diversified. Wire rod demand is sluggish. Prices are well maintained.

New York—Sentiment among wire producers has improved, based on an expected moderate gain in specifications this month rather than any immediate increase in demand, which is slack. While dull, finishing operations on some types of wire products, notably manufacturer's wire, are above that for most lighter steel products. Wire, for instance, has been leading strip, due probably to greater diversity of products. Domestic wire rod business is slow, but some fair inquiries for export are appearing on which prices are weak and lower than domestic quotations, which are being firmly held.

One of the largest inquiries for common wire nails, approximately 3000 kegs, or close to 150 tons, is bid Jan. 10 with the state procurement division, treasury department, New York, schedule C-1-6.

Semifinished

Semifinished Prices, Page 73

Demand for billets, sheet bars and slabs is developing slowly, evidently due to inability of nonintegrated mills to outline production schedules definitely. Buying of semifinished steel is largely hand-to-mouth.

Rails, Cars

Track Material Prices, Page 73

With bids open Jan. 10 eastern carbuilders are focusing principal attention on the list of 1100 miscellaneous freight cars for the Western Maryland. However, Canadian railroads now have a large program up, with the Canadian Pacific having just entered the market with 277 miscellaneous freight cars and 10 locomotives.

Some rails are being placed, Chesapeake & Ohio having divided 27,500 tons among three producers and Norfolk & Western 25,000 tons between two mills. Pere Marquette closed on 1700 tons of rails with Carnegie-Illinois Steel Corp., 1350 tons with Inland Steel Co. and 500 tons with Bethlehem Steel Co.

Domestic freight car awards in December, involving 275 cars, brought the total for the year 1937 up to 51,611, against 64,643 in 1936; 19,308 in 1935; and 23,829 in 1934. Last month's total of 275 was the same as the total for November and was accounted for by one purchase, that of the Louisiana & Arkansas. Further comparisons follow:

	1937	1936	1935	1934
Jan.	17,806	2,050	24	152
Feb.	4,972	6,900	806	19,725
March	8,155	632	0	30
April	9,772	4,427	350	800
May	4,732	8,900	2	717
June	548	5,200	5,151	1,835
July	1,030	7,229	500	19
Aug.	1,475	225	200	105
Sept.	1,216	1,750	875	7
Oct.	1,355	2,210	1,250	75
Nov.	275	1,550	100	254
Dec.	275	23,450	10,050	110
Total	51,611	64,643	19,308	23,829

Locomotives Placed

Chicago, Milwaukee, St. Paul & Pacific, six, type 4-6-4, steam passenger locomotives to American Locomotive Co., New York.

Chicago & Eastern Illinois, three 600-horsepower diesel switching locomotives; two to Electro-Motive Corp., La Grange, Ill., one to American Locomotive Co., New York.

Rail Orders Placed

Chesapeake & Ohio, 27,500 tons, divided as follows: Bethlehem Steel Co., 3200 tons, Inland Steel Co., 9600 tons, Carnegie-Illinois Steel Corp., 14,700 tons.

Norfolk & Western, 25,000 tons, 18,750 tons to Carnegie-Illinois Steel Corp. and 6250 tons to Bethlehem Steel Co.; 300 tons track bolts divided between five suppliers; 15,000 kegs spikes and 3000 tons tie plates remain to be placed.

Pere Marquette, 3550 tons, 112-pound, as follows: Carnegie-Illinois Steel Corp., Pittsburgh, 1700 tons; Inland Steel Co., Chicago, 1350 tons; Bethlehem Steel Corp., Bethlehem, Pa., 500 tons.

Car Orders Pending

Canadian Pacific, 2700 miscellaneous freight cars, bids asked; included are 2000 40-ton steel box cars, 200 twin hopper cars, 200 flat cars, 200 steel underframe stone cars and 100 low-side drop-end gondolas.

Chicago & North Western, 12 streamlined light weight passenger coaches, bids asked.

Chesapeake & Ohio, 25 covered hoppers, 70-ton capacity; bids asked.

United States War department, five to 35 10,000-gallon tank cars, American Car & Foundry Co., New York City, low bidder; on an alternate involving used cars the Hyman-Michaels Co., Chicago is low bidder.

Locomotives Pending

Norfolk & Southern, five locomotives; bids asked.

Canadian Pacific, 10 Hudson-type locomotives, bids asked.

Buses Booked

American Car & Foundry Motors Co., 15 motor coaches, powered with Hall-Scott horizontal engines, 10 for the Staten Island Coach Corp., New York City; 4 for the Tripe Cities Traction Corp., Binghamton, N. Y.; and one for the F. D. & D. S. Bus Co., Bayonne, N. J.

American Car & Foundry Motors Co., New York, 45 36-passenger parlor coaches, powered with Hall-Scott horizontal engines for the Sante Fe Trail Transportation Co.

Shapes

Structural Shape Prices, Page 72

New York — Awards are slightly heavier, including 3000 tons for five New York city schools. While bids on a 5950-ton bridge over the Long Island railroad, Lynbrook, N. Y., were returned unopened, there is a growing inquiry for smaller state bridges and miscellaneous needs, mostly public work.

Philadelphia—The Pennsylvania State institutional program will continue active at least through March. Included among important projects for which dates for bids have not been named as yet are Danville State hospital, Maximum Security prison at Mt. Gretna, buildings for West Chester State Teachers college and Mt. Alto Tuberculosis hospital. The appropriation for the latter job alone is $4,765,000 and for Mt. Gretna $2,475,000. Bids will be taken Jan. 21 for additional buildings for Penn State college which will require 2000 to 3000 tons of structurals, with miscellaneous material, including pipe. Bids went in on several smaller state jobs Jan. 4, taking about 1500 tons of structurals. Private work continues slack.

Boston—Except for 570 tons for a hangar building, Warwick, R. I., placed with a Providence fabricator, structural awards are in small tonnages. Bridge inquiry is small. The first substantial project expected out for New Hampshire, is about 1500 tons. Few large-tonnage projects are being estimated, but small construction jobs, mostly public work, are fairly numerous.

Cleveland — Fabricators continue on substantially reduced schedules as awards are negligible. However, some improvement in inquiries has been noted and pending list contains a fair tonnage for state work. Mill prices are firm while fabricated prices continue unsteady.

Chicago—Bridge work features fabricated shape awards and inquiries. For the Mississippi river bridge at La Crosse, Wis., 3250 tons has been placed, while bids are being asked on a bridge at Hennepin, Ill., requiring 1800 tons.

San Francisco — The structural market was active with 2962 tons placed. This brought the total awarded during 1937 to 151,260 tons, compared with 173,247 tons for 1936 and 142,718 tons for the average placed during the past sixteen years. Columbia Steel Co. secured the largest award, 573 tons for a crossing over the Los Angeles river, Los Angeles, for the Southern Pacific Co.

Seattle—Demand for structurals is fairly active and additional projects of importance are scheduled for early action. The week's awards included 290 tons for the Sand Point, Seattle, naval air station. Approximately 600 tons will be required for the Seattle armory building, bids Jan. 11. Other pending projects include 600 tons steel piling for Washington state Puget Island bridge, and 250 tons for the Washington state Skykomish river bridge.

Shape Awards Compared

	Tons
Week ended Jan. 8	**16,687**
Week ended Jan. 1	**8,835**
Week ended Dec. 25	**10,740**
This week, 1937	**16,544**
Weekly average, 1937	**23,281**
Weekly average, 1938	**12,761**
Weekly average, December	**13,591**
Total to date, 1937	**50,280**
Total to date, 1938	**25,522**

Includes awards of 100 tons or more.

Shape Contracts Placed

3300 tons, state bridge over Mississippi river, FAP-397-G, LaCrosse, Wis., to Bethlehem Steel Co., Bethlehem, Pa.

1525 tons, power plant addition, Lansing, Mich., to R. C. Mahon Co., Detroit.

1075 tons, public school 118, Bronx, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., $90,879, steel direct, fabricating and erecting; bids Dec. 29, board of education, New York.

1075 tons, public school 10, Queens, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., $90,879, steel direct, fabricating and erecting; bids Dec. 29, board of education, New York.

800 tons, Homestake Mining Co., Lead, S. Dak., to Worden-Allen Co., Milwaukee.

770 tons, fourteen-story apartment, Twentieth street and Seventh avenue, New York, to Lehigh Structural Steel Co., Allentown, Pa., through H. A. Hyman Corp., New York.

750 tons, state bridge, President Van Buren farm Columbia county, New York, to American Bridge Co., Pittsburgh; through Lane Construction Corp., Meriden, Conn.

633 tons, warehouse for Oahu Railroad Co., Honolulu, T. H., to unnamed interest.

573 tons, crossing over Los Angeles river, Los Angeles for Southern Pacific Co., to Columbia Steel Co., San Francisco.

560 tons, hangar building, Warwick, R. I., to Providence Steel & Iron Co., Providence, R. I.

465 tons, public school 119, Bronx, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., $39,879, fabricating and erecting; bids on steel direct.

460 tons, public school 124, Bronx, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., $39,179, steel direct, fabricating and erecting; bids Dec. 29, board of education, New York.

350 tons, power-house addition, Louisiana Steam Generating Corp., Baton Rouge, La., to Virginia Bridge Co., Roanoke, Va.

350 tons, school, Polk, Pa., to Guibert Steel Co., Pittsburgh. McCloskey & Co., Philadelphia, general contractor.

300 tons, bridge, Spring street, Louisville, Ky., to Virginia Bridge Co., Roanoke, Va.

290 tons, navy structures Sand Point air station, Seattle, to Midland Structural Steel Co., Cicero, Ill.

252 tons, shapes and bars, grade separation and approaches, Cass county, North Dakota, to Bethlehem Steel Co., Bethlehem, Pa.; Rue Construction Co., Bismarck, N. Dak., general contractor.

250 tons, repairs to state bridge, route 183, Catawissa, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

235 tons, Long Beach main line—Pacific Electric railway bridge for United States engineer office, Los Angeles, to Lakeside Bridge & Steel Co., Milwaukee, Wis.

225 tons, Centinela avenue bridge, Los Angeles for United States engineer office, to Bethlehem Steel Co., Los Angeles.

220 tons, public school 134, Queens, N. Y., to Bethlehem Fabricators, Inc., Bethlehem, Pa., $17,875, fabricating and erecting; bids on steel direct.

215 tons, Shrine temple, Peoria, Ill., to Mississippi Valley Structural Steel, Co., Decatur, Ill.

205 tons, school, Richfield Springs, N. Y., to Syracuse Engineering Co., Syracuse; through Duplex Construction Co., Glens Falls, N. Y.

162 tons, school, Endwell, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; J. T. Kane, Binghamton, N. Y., general contractor. Truscon Steel Co., Youngstown, O., awarded reinforcing steel.

150 tons, state bridge WPGH-X2 of 52-2-20, C1, Harvey, Mich., to American Bridge Co., Pittsburgh.

140 tons, high school, Butler, N. J., to Hudson Structural Iron Works, Jersey City, N. J.

130 tons, steel sheet piling, bureau of reclamation, Denver, for delivery at Yuma, Ariz., to Inland Steel Co., Chicago; bids Dec. 21, schedule A-42446-A.

125 tons, bridge, No. 37-34, Orange county, New York, to Phoenix Bridge Co., Phoenixville, Pa.; through William J. Vanderwater Co., Flushing, N. Y., general contractor.

125 tons, Seattle light department structure to A. S. Schulman Electric Co., Chicago, and Isaacson Iron Works, Seattle.

115 tons, 3-story and basement addition, A. C. Gilbert Co., New Haven, Conn., to Berlin Construction Co., Berlin, Conn.; Mott-Mohr Construction Co., New Haven, general contractor.

112 tons, men's dormitory, Michigan State college, East Lansing, Mich., to Jarvis Engineering Works, Lansing; Reniger Construction Co., Lansing, general contractor.

110 tons, theater building, Harrisburg, Pa., to Belmont Iron Works, Eddystone, Pa.

110 tons, bridge, Sixty-Ninth road, Queens, New York, to American Bridge Co., Pittsburgh; through Young-Fehlhaber Pile Co. Inc., New York.

110 tons, shapes and bars, addition, James F. Bundy school, Washington, D. C., to Dietrich Bros., Baltimore, and Bethlehem Steel Co., Bethlehem, Pa.; Lacchi Construction Co., Baltimore, general contractor.

108 tons, Garcia river bridge, Mendocino county, California, to unnamed interest.

107 tons, Petworth branch library, Washington, D. C., to Lehigh Structural Steel Co., Allentown, Pa.; Carlstrand Engineering Corp., Baltimore, general contractor. Rosslyn Steel and Cement Co., Washington, awarded reinforcing steel.

105 tons Lower Canada boulevard bridge, United States engineer office, Los Angeles, to Bethlehem Steel Co., Los Angeles.

100 tons, shapes and bars, post office, Ridgefield, N. J., to Selbach-Meyers Co., Union City, N. J., and Joseph T. Ryerson & Son, Inc., Jersey City; John de Beer, Ridgefield, general contractor.

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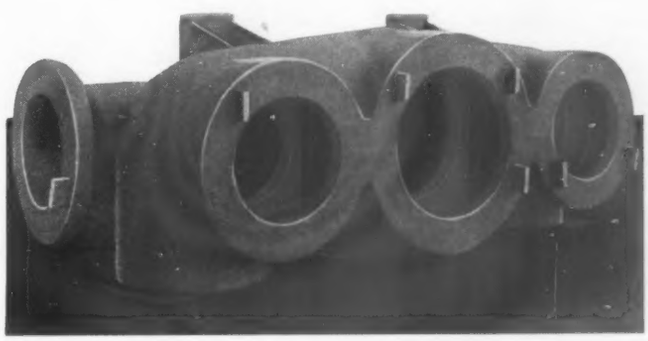

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Behind the Scenes with STEEL

Old Chappie!

■ May we Shrdlu-ize a bit on that article dealing with Chapmanizing? As far as is known, the technical press up to this time has carried no material quite as complete as R. L. Rolf's interesting discussion of this process on page 48. And the author, if we may be permitted to coin a phrase, knows his onions when it comes to Chapmanizing. The new Heat Treating label head, incidentally, is another example of departmentalizing the technical articles that appear in STEEL.

Debutantes Page

■ Wring out the old, ring in the news! A page devoted to New Metal Products also makes its debut as a department in this issue. Herein will be listed manufacturers' new developments that embody the use of steel, iron, brass, copper, tin or other metals. Regular perusal of this page will reveal new applications, new uses, new fields, new markets for metals. From pins to power plants, from ice cream freezers to unit heaters the births of industry's brainchildren will be faithfully recorded.

Red Tape Dept.

■ We were among the first to get tangled in the 1938 variety of government and efficiency. A lawge, well-stuffed envelope came to our desk last week. A cryptic message, "Damaged in Cancelling Machine," helped explain the mangled condition of the otherwise impressive document. Plowing through the ten important-looking sheets therein, we came across such Sanskrit as "Appropriation 1480800 Geo. Survey, 1938 (Gaging Streams), Survey 2270, Method of Purchase—Open Market, Purchase Order No. H-448, Item No. O. M. Enclo. 1486883." Finally we filled in five yellow sheets and two white ones, then called a consultation of editors. Just as the sun sank into Lake Erie, the elevator boy solved the solution—Uncle Sam wanted to buy three back copies of STEEL.

Getting a Head

■ We point with pride and view with no alarm the new label heads that enhance the first page of each technical department now, this in keeping with our endless modernization program. Accompanying the new labels will be terse heads, supported by subheads that digest the article following. Thus the timely information in each issue of STEEL will be placed even closer to your finger-tips.

Copy, Boy, Copy!

■ The big STEEL Yearbook of Industry issue came out with 8 advertising cuts run upside down, 3 stories unedited, 12 misspelled heads, 14 captions missing, 4 timetables (Cleveland to Tahiti) run in by mistake, and we, somehow blamed for the whole thing, were immediately discharged not only without a two week notice but forced to refund our last two months' salary—such was our nightmare prior to awakening to find the 430-page book had rolled off the presses and into the mails *on time*. The Pittsburgh Panthers never showed prettier precision work than STEEL's 24 editors—every detail was checked and rechecked, every bit of copy bounced in at the scheduled moment. Incidentally, the easiest way to find anything in the book is by the index. Can't find it? Well, it's opposite page 164. And now, having given you four pounds of facts, reviews, charts and ideas, the boys are hard at it to keep you up to the minute every week as we plow into the hectic, harassing hours of the year 1938.

—SHRDLU

Shape Contracts Pending

5850 tons, bridge, Long Island railroad, Lynbrook, N. Y., temporarily withdrawn, bids of Dec. 29, not opened.

2000 tons, state bridge over Illinois river, Hennepin, Ill.

1000 tons, bulb angles, procurement division, treasury department, New York.

750 tons, sheet piling, Indian river inlet, jetty construction, Frankford, Del.; U. S. Army Engineers, Washington, take bids Jan. 25.

650 tons, main building, sugar factory, Amalgamated Sugar Co., Nyssa, Oreg.

600 tons, state highway bridge, route 50, Cook county, Illinois.

600 tons, administration, hospital and auditorium building Auburn State prison, Auburn, N. Y., bids Jan. 20.

600 tons, armory, Seattle; bids Jan. 11.

500 tons, bridge, Bayville, N. Y.; Andrew Weston Co., Woodmere, N. Y., low.

470 tons, building Bloomsburg State Teachers college, Bloomsburg, Pa.

460 tons, hospital, Fairview, Pa., Irvin & Leighton, Philadelphia, low on general contract at $417,000.

450 tons, shapes and bars, building No. 53 and sewage plant additions, veterans' hospital, Lyons, N. J.; C. H. Johannsen & Co., Cliffside Park, N. J., low, bids Dec. 28.

400 tons, shapes and bars, municipal garage, Bronx, N. Y.; Weiss & Weinsier Inc., Brooklyn, low.

400 tons, alterations to building, Hospital of Joint Diseases, New York.

380 tons, bridge, Yerba Buena Island, San Francisco for United States engineer office; bids Jan. 21.

350 tons, office building, Long Island Lighting Co., Mineola, N. Y.

325 tons, including 150 tons, steel sheet piling, state bridge, Buffalo-Cheektowaga road, Erie county, New York; Metzger Construction Corp., Buffalo, general contractor, bids Jan. 4, Albany.

300 tons, reconstruction, Fassett street bridge, Maumee river, Toledo, O.; bids Jan. 18.

300 tons, buildings, Swift & Co., Vernon, Calif.; bids opened.

300 tons, power house, Gable street station, Houston, Tex.

275 tons, store building, S. S. Kresge Co., Springfield, Mass.

250 tons, Tertianship college, addition to Jesuit Fathers shrine, Auriesville, N. Y., bids Jan. 14.

230 tons, piling, Harlem road crossing, New York Central tracks, Cheektowaga, N. Y.; includes 80 tons reinforcing.

220 tons, buildings, Hazelton State hospital, Hazelton, Pa., Alaimo & Son, Pittston, Pa., low at $215,960.

210 tons, laundry building, East Forty-ninth street, New York.

200 tons, addition to building, Union stockyards, Wilson & Co., Chicago.

200 tons, state highway bridge, Tioga county, New York; bids Jan. 9.

200 tons, Dalton school, Porter Building Co., Buffalo, general contractor.

200 tons, building, teachers college, Slippery Rock, Pa., bids Jan. 11.

200 tons, school, Monticello, Ind.

200 tons, boiler and machine shop extension, St. Louis Southwestern railroad, Pine Bluff, Ark.

200 tons, power house, Ashville, O.

200 tons, factory, West Plains, Mo.

164 tons, University of Washington swimming pool; Western Construction Co., Seattle, general contractor, includes 69 tons reinforcing.

155 tons, troop armory, Philadelphia, Hadley Contracting & Construction Co., Philadelphia, low at $122,800.

150 tons, state bridge over Lehigh Valley railroad, 35, extension section 12, Woodbridge, N. J.; bids Jan. 10, Trenton.

150 tons, bridge, Reading Co., Reading, Pa., bids Jan. 11.
140 tons, addition, City hospital, Cambridge, Mass.
133 tons, sheet piling, United States Engineer Office, Los Angeles, proposal 182; bids opened.
120 tons, sheet piling, bureau of reclamation, invitation A-42, 446-A, Yuma, Ariz.; bids opened.
110 tons, bridge No. 19112, Chicago, Burlington & Quincy railroad, Dubuque, Ill.
110 tons, I-beam viaduct FAP 186-B, Forestburg, S. Dak., for state.
108 tons, bridge near Sanger, Fresno county, California; bids opened.
Unstated, buildings, Penn State college, State College, Pa., bids Jan. 21.
Unstated, armory, Cannonsburg, Pa., bids Jan. 21. The building is of steel frame construction.
Unstated, gates and frames for Coulee dam; bids in.

Reinforcing

Reinforcing Bar Prices, Page 73

New York—With the exception of 1000 tons for a housing project, Newark, N. J., reinforcing steel purchasing is confined mostly to fairly numerous small lots. Pending inquiry is heavier, however, which coupled with 1500 tons for first quarter New York city requirements closed Jan. 10 will subject new quotations to a real test. Highway mesh requirements for New York state are slightly heavier, but contractors are slow to close as much of the material will not be needed until spring.

Boston—Reinforcing steel activity revolves around 25 to 50-ton inquiries, aggregate buying being light. Few projects are pending taking as much as 100 tons each. Although not tested by tonnage, 2.95c, delivered, job, is generally holding. Northern Steel Co. booked reinforcing for the reformatory buildings, Framingham, Mass.

Philadelphia—Reinforcing bar sellers maintain that prices quoted to consumers are definitely stiffer, being predicated upon the 2.45c, Pittsburgh base, plus usual extras. Considerable work is coming out in connection with the Pennsylvania institutional program. Part of this work is going to rail steel makers with the usual $3 differential said to be applying.

Cleveland — Inquiries continue generally limited to small tonnages for schools and other public projects. Awards fall into the same classification with the one exception which Carnegie-Illinois Steel Co. booked recently, requiring 375 tons for Pennsylvania railroad's expansion program at its Sandusky, O., unloading dock. Prices have shown greater firmness.

Chicago—New inquiries for reinforcing steel include only small lots and pending business is the smallest in several months. Action is deferred on a number of building projects pending and some hesitation is noted in plans to proceed with certain proposed construction.

San Francisco—A fair volume of reinforcing bar tonnage was placed during the last week of 1937 totaling 2601 tons. This brought the year's aggregate to 101,421 tons, compared with 243,205 tons in 1936. The average placed during the past 16 years is 87,745 tons. Bureau of reclamation has recently placed 1919 tons for 26 projects located in nine of the eleven western states, of which Bethlehem Steel Co. booked 994 tons.

Concrete Bars Compared

	Tons
Week ended Jan. 8,.....	10,059
Week ended Jan. 1.....	3,419
Week ended Dec. 25.....	4,939
This week, 1937.....	6,215
Weekly average, 1937.....	6,266
Weekly average, 1938.....	6,739
Weekly average, December	4,111
Total to date, 1937	6,680
Total to date, 1938	13,478

Includes awards of 100 tons or more.

Reinforcing Steel Awards

4193 tons, proposal 171, United States engineers office, Los Angeles, to Soule Steel Co., Los Angeles.
1004 tons, state bridges, Clinton county, Mississippi, divided as follows: 823 tons to Sheffield Steel Corp., Kansas City, Mo., and 131 tons to Laclede Steel Co., St. Louis; through M. E. Gillioz Co., Monette, Mo. Balance of structural going to Virginia Bridge & Iron Co., Roanoke, Va.
1000 tons, apartments, Newark, N. J., to Joseph T. Ryerson & Son, Inc., Jersey City, N. J.; MacEvoy Construction Co., Newark, general contractor.
713 tons, bureau of reclamation, Earp, Calif., to Bethlehem Steel Co., Bethlehem, Pa.
400 tons, viaduct, Eggleston avenue, part of Columbia avenue development, Cincinnati, to Truscon Steel Co., Youngstown, O.
375 tons, retaining wall, Pennsylvania railroad's unloading dock, Sandusky, O., to Carnegie-Illinois Steel Corp., Pittsburgh; Great Lakes Dredge & Dock Co., Cleveland, general contractor.
300 tons, hospital, Harrisburg, Pa., to Sweet's Steel Co., Williamsport, Pa., John McShain Inc., Philadelphia, general contractor.
215 tons, Washington state Skagit river bridge, to Bethlehem Steel Co., Seattle; MacRae Bros., Seattle, general contractor.
200 tons, building, U. S. department of

SHEET AND TINPLATE LIFTERS

2 TO 60 TON

Right. 5 ton capacity hand operated Lifter in storage department of manufacturing plant. Note very small space between piles.

WRITE FOR BULLETIN SL-14

Left. 20 ton capacity motor operated Lifter. Note how cut-outs in carrying angles facilitate picking lifts of hot rolled sheets from rollers of run-out table.

C-F—SHEET LIFTER—C-F

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research, Abingdon, Va., to American Steel Engineering, Philadelphia.

159 tons, bureau of reclamation, invitation A-42, 419-A, Calexico, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, school, Vestal, N. Y., to Concrete Steel Co., Syracuse, N. Y., through O'Connell Co., Binghamton, N. Y., general contractor; previously erroneously reported awarded to Bethlehem Steel Co.

132 tons, bureau of reclamation, invitation A-42, 411-A, Cantu, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

129 tons, building on Van Ness and Greenwood avenue, San Francisco, to Gunn, Carle & Co., San Francisco.

122 tons, bureau of reclamation, invitation 44,247-A, Earp, Calif., to Judson Steel Corp., Emeryville, Calif.

110 tons, men's dormitory, Michigan State college, East Lansing, Mich., to Truscon Steel Co., Youngstown, O.; Reniger Construction Co., Lansing, general contractor.

105 tons, bars and bar joists, school, Livingston Manor, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Rathgeb-Walsh, Inc., Port Chester, N. Y., general contractor.

102 tons, bars and shapes, court house, Portales, N. Mex., to Mosher Steel Co., Dallas, Tex.; C. S. Lambie & Co., Amarillo, Tex., general contractor.

100 tons, bureau of reclamation, invitation C-23, 023-B, Boulder City, Nev., to Judson Steel Corp., Emeryville, Calif.

100 tons, highway project, route 35, Middlesex county, New Jersey, to Joseph T. Ryerson & Son Inc., Chicago; through Franklin Contracting Co., Newark, N. J.

100 tons, Edward Smith junior high school, Syracuse, N. Y., to Concrete Steel Co., New York.

100 tons, bureau of roads span Rainier national park, Wash., to unstated interest; Sam Arino, Bonneville, Oreg., general contractor.

100 tons, Oregon state bridge, Grant county, to unstated interest; Leonard & Slate, Portland, general contractor.

100 tons, road work, Lycoming county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, hospital, Huntington, Pa., to Sweet's Steel Co., Williamsport, Pa.

100 tons, bars and shapes, building, state reformatory, Framingham, Mass., to Northern Steel Co., Boston, and A. O. Wilson Structural Co., Cambridge, Mass.; Rugo Construction Co., Boston, general contractor.

Unstated tonnage, school, Wyoming, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; A. Friederich & Sons Co., Rochester, N. Y., general contractor.

Reinforcing Steel Pending

1300 tons, Crooked Creek dam, near Ford City, Pa.; George M. Brewster & Son, Inc., Bogota, N. J., bids Dec. 17 to U. S. engineer, Pittsburgh. Work also takes 205 tons, structural steel; 50 tons, metal work and 107 tons, cast iron, steel and wrought iron pipe.

1300 tons, Tionesta, Pa., dam; S. J. Groves & Sons Co., Minneapolis, Minn., low, bids Dec. 18 to U. S. engineer, Pittsburgh. Work also takes 105 tons, structural steel; 55 tons, metal work; 220 tons, cast iron, steel and wrought iron pipe, and 10,000 linear feet, highway guard rail.

800 tons, Seattle armory; bids to state armory board, Camp Murray, Wash., Jan. 11.

500 tons, buildings, Swift & Co., Vernon, Calif.; bids opened.

370 tons, bridge, 140th street and Grand Concourse, Bronx, N. Y.; Garafano Construction Co. Inc., Mt. Vernon, N. Y., low; work also takes 75 tons of structural steel; bids Dec. 30.

275 tons, bridge, over Elk river, Charleston, W. Va.

141 tons, addition to state hospital, Stockton, Calif.; bids opened.

140 tons, contract 11-A, sanitary district of Chicago.

120 tons, highway, routes 28-24, connecting link, section 1, Warren county, New Jersey; bids in.

116 tons, central grade and high school, Dundee, N. Y.

100 tons, building, Cremo Brewing Co., New Britain, Conn.

100 tons, John Dewey high school, West Allis, Wis.

100 tons, bridge, Yerba Buena Island, San Francisco; bids Jan. 21.

Pig Iron

Pig Iron Prices, Page 74

Pittsburgh—Interest continues to drag in the pig iron trade with occasional shipments being made on contracts and new business confined to a few carloads. Steelmaking grades are receiving little attention.

Cleveland — Pig iron sellers are somewhat disappointed in current requirements. Most foundries are still on a substantially reduced operating schedule and are ordering only for actual needs. At least one producer expects little improvement in sales or shipments during January. Blast furnace operations are unchanged at the low levels of the latter part of December. Prices are firm.

Chicago — Resumption of operations by some foundries that were down over the year-end has been followed by better releases of pig iron. Producers anticipate only a moderate pickup in shipments this month, some interests estimating the gain at 10 per cent over December. New business is light with the market steady at $24, furnace, for No. 2 foundry and malleable.

Boston—Pig iron buying continues light, mostly in small lots for prompt delivery. Few consumers have covered fully for estimated needs this quarter and not many venture a guess as to such requirements. Some melters also are less certain present prices will hold, although sellers who have been offered export business at $2 and more under the domestic market have turned down such orders. While some foreign business has been booked under domestic prices, the concessions have not been that much.

New York — Sellers are anticipating a modest pickup over the remainder of January following inventory. However, they look for spotty business for several weeks to come. Troy Furnace Corp., Troy, N. Y., recently suspended operations for the time being, leaving only two or three merchant stacks active along the eastern seaboard.

Bids close Jan. 14 on 463 tons, foundry pig iron, with the bureau of supplies and accounts, navy department, the largest tonnage being for Norfolk, Va., 233 tons. This is in addition to 626 tons recently bid and on which some price shading developed.

Philadelphia — Pig iron inventories are low but as yet consumers have little incentive for placing additional tonnage for the current quarter. Some first quarter tonnage was placed on sellers' books during late November and December and a few carlot releases against this have been issued this month. Little or no improvement is evident in foundry operations but at least a moderate lift is anticipated as the month progresses. No deviations are noted in prices quoted domestic consumers.

Buffalo—Pig iron producers were cheered by the mild expansion in requests for shipments with the start of the new year. A few new orders also were reported although there appears to be a sizable carryover of contracts from the previous quarter. Foundries are operating two to four days a week. Lending strength to the situation is a marked falling off in inventories during the past week.

Cincinnati — The light melt is reacting against renewed activity in pig iron, dullness of the holiday season not having been dissipated. Some contracting with usual sources has been done and a fair tonnage of iron is carried over.

St. Louis—Producers and distributors of pig iron report the quietest week or ten days experienced in more than two years. Buying is confined to an occasional carlot, and shipments are light. The movement during December was the smallest of the year, and much below that month in 1936, when, it will be recalled, shipments were unusually large because of anxiety of melters to get in cheap contract iron.

Birmingham, Ala. — The pig iron market continues comparatively quiet, although smelters believe an upturn in demand is likely before the end of the first quarter. Twelve furnaces are blowing.

Seattle — Foundry operations have tapered to new lows and only small tonnages of pig iron are being sold. Prospects are not promising for the immediate future. Columbia iron, used generally in this area, is unchanged for the first quarter at $22, base, Provo, Utah.

Toronto, Ont.—Business as a whole was listless during the past week or ten days. Pig iron sales dropped to the lowest point for months and only odd car lots were

shipped. Producers have opened books for first quarter contracts and a number of inquiries have been sent out by melters. Actual booking for first quarter is slow but it is expected there will be a good flow of orders within the next couple of weeks. The daily melt tapered off during the holiday season, a seasonal slump, and most companies are preparing for a return to normal activities. Pig iron prices are firm and unchanged.

Scrap

Scrap Prices, Page 76

Pittsburgh — Some negotiators for iron and steel scrap, who had suspended activities until the closing of the Pennsylvania railroad list Jan. 6, now are resuming. The slightly higher prices received on the Baltimore & Ohio scrap list closing Dec. 28 seem to be spurring the trade into expectancy over the probable bids on the Pennsylvania offerings. However, immediate activity in this market here is shown in only comparatively small lots actually being shipped. It is understood that some of the Baltimore & Ohio long rails, which were allotted to this district some days ago, are being laid down in the yards of dealers.

Chicago — Scrap is weaker, following an upturn in prices the past several weeks when dealers and brokers were covering old orders. Mill buying has failed to appear and lower figures prevail. Only a moderate amount of consumer buying is in prospect this month, with mills indicating they are unwilling to pay more than $13 for heavy melting steel. On the basis of dealer and broker trading, this grade lately has been nominal at $13 to $13.50. Scrap demand from foundries continues moderate. Dealers show increased interest in disposing of tonnages accumulated during recent weeks.

Boston—Scrap prices for the most part are unchanged with a firm undertone despite light domestic demand. Boat loadings for export continue active with $14, dock, paid for No. 1 heavy melting steel, although slightly better is reported bid for tonnage. Other grades for dock delivery are steady, as are prices for Pennsylvania delivery.

New York—Routine buying continues in fair volume for export, brokers paying $13.50 for No. 1, delivered, barge, this price being unchanged for nearly two months. Other grades are unchanged, except stove plate, which is slightly stronger. Little domestic business is being done with prices steady and for the most part unchanged.

Philadelphia — No. 1 heavy melting steel no longer is available to district steelmakers at less than $15, delivered, and the market has been established firmly at that level after ranging from $14.50 to $15 for several weeks. Some material is being picked up at $15 but consumers are not interested in making tonnage commitments as yet. The monthly compressed sheet accumulation of a district auto body maker has been sold at the equivalent of $15, delivered nearest consuming point. About 2500 tons were involved. With the exception of mixed yard cast, other grades have not participated in the stronger market for heavy steel. Tone of the market, however, is buoyant. The dealer trade, especially, is convinced that prices are heading for higher levels. Independent dealers are buying some scrap for a boat due late this month, paying $15 and $14, f.a.s. respectively, for No. 1 and 2 grades.

Buffalo — Dealers in iron and steel scrap appear rather definite in their stand of refusing to make tonnage sales at present price ranges. Efforts to pick up scrap meet difficulty, especially in view of the upturn in steel ingot operations. For this reason quoted prices still are regarded as nominal. While the range on No. 1 heavy melting steel is $13 to $13.50 a ton, dealers say that inquiries being placed at these levels are not being filled. The chief consumer is in the market for scrap at the inside figure of the prevailing range, but as yet, no tonnage sales have been reported.

Detroit — The scrap market continues in the doldrums, with scant tonnages moving and prices unchanged from the current low level. Automotive lists have been extremely light, but have not elicited lower prices. One scrap interest here is handling only about 20 per cent of its normal tonnage.

St. Louis — The market for iron and steel scrap has not worked out of the holiday lull, and save for a little dealer trading business was virtually at a standstill. Offerings from all quarters are scant. No railroad lists are before the trade, and shipments from country points have almost reached the vanishing point. Buying by melters is not expected much before the third week in January, about which time it is thought mills will be in the market for supplies.

Birmingham, Ala. — Scrap is particularly quiet and purchases are

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Seattle — Conditions are unchanged. Sales are slow and infrequent as mills are entirely out of the market and exports are at a standstill. Reports from Japan indicate no active buying in the immediate future although credits can be established for any consignments urgently required. Dealers are well stocked at tidewater and will not make purchases except at prices attractive for speculation.

Warehouse

Warehouse Prices, Page 75

New York — Slight increase in small orders with more inquiries has lifted demand for steel from warehouses somewhat above the December rate. Average jobber stocks of sheets are more evenly balanced, excess holdings of some finishes, notably galvanized, having been fairly well liquidated, but at price concessions during the recent competitive market in which some distress material was moved. Price cutting on various products continues. Jobber buying demand on mills closely parallels their own volume.

Philadelphia — Warehouse interests note moderate improvement in inquiries which are expected to materialize in a larger January volume as compared with December.

Boston—Sharp reduction in galvanized sheet prices has not been followed by revision in other sheet quotations by warehouses, such prices being firm and unchanged, including galvannealed. While still light, volume with jobbers has gained slightly, due mostly to moderate improvement in small orders. On most items warehouse prices are steady.

Baltimore—Steel warehouse distributors here anticipate slightly better business this month, with the passing of the holiday and inventory periods. However, they look for no appreciable gain much before the latter part of February.

Cleveland — Warehouse distributors report the daily average shipments so far this month remain almost unchanged from the comparable period a month ago. Current requirements are principally for fill-in purposes and little improvement is expected until operating schedules among their own customers show a definite upward trend. Prices remain firm.

Chicago—Sales have recovered moderately but encouragingly from the holiday lull. Expectations are for further gains this month as effects of the inventory period usually prevail until about the middle of January. Former prices are being continued.

Detroit — Warehouse trade in iron and steel is little changed from recent weeks and there is some hope for some improvement soon. A number of tool and die shops here are busy on work for one of the large automobile builders, and many are predicting programs for tool and die changes for 1939 models will be released earlier this year.

Cincinnati — Despite dull business late in 1937, warehouse tonnage for the entire year exceeded that of 1936. Sales since the holidays are only moderately improved. Prices are unchanged.

St. Louis — Resumption of activities at a number of railroad shops and other post holiday resumptions has been reflected by more active buying of steel from store. December sales were the smallest for any month in 1927, and measurably below the total for that month in 1936.

Seattle — December volume was about the same as November but both months totaled less than the corresponding period last year.

Tin Plate

Tin Plate Prices, Page 72

New York—The smaller canmakers in this district, mostly engaged on specialty containers, and the large dairy companies, which fabricate their own requirements, appear to be covered on tin plate until the end of February. The position of the large canmakers, with a national scope of operations, is less clear, but the fact remains that recently they have contracted for relatively little new tonnage. Their needs may pick up soon, however, as the canning of fish, salmon in particular, usually gets under way late in February.

Pittsburgh—Placing of routine time contracts by large canning companies and other consuming interests having been accomplished in part, the trade now seems to be awaiting the national canners' convention scheduled for Chicago in about three weeks. Following this buyers, including jobbers, seem likely to be able to plan more definitely on the spring and early summer trade. Meanwhile there is sufficient prospective business to keep mills operating around 50 to 55 per cent of capacity, largely on standard sizes for stock.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Shipwork looms as the principal outlet for bolts, nuts and rivets at this time, what with the Standard Oil Co. of New Jersey having just closed construction contracts for 12 tankers and the New York Shipbuilding Corp., Camden, N. J., about to close on requirements for two large navy tankers. Moreover, there is the Maritime commission's inquiry for 12 cargo ships on which bids will be opened Feb. 1. Some tonnage is also pending in the railroad field, including 300 tons of track bolts on which the Norfolk & Western has just closed bids and requirements for the 1100 freight

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cars for Western Maryland, are scheduled to be opened Jan. 10.

Demand continues spotty, with little recovery from the restricted demand of late December. Jobbers have curtailed stocks the past few months but as yet are not interested in building up inventories. A like situation prevails among consumers. Continued quiet among railroad shops is holding down demand for bolts, nuts and rivets in that direction; farm equipment manufacturers are maintaining relatively good schedules. Rivet needs of structural fabricators are steady but rather quiet.

Iron Ore

Iron Ore Prices, Page 76

Cleveland—Nonbessemer iron ore constituted 75.8 per cent of all the ore shipped from the Lake Superior district in 1937, according to the Lake Superior Iron Ore association, Cleveland. The percentage of bessemer was 19.2 per cent. Tonnages by grades:

	1937	1936	% Gain
Nonbessemer	46,978,744	33,095,687	41.9
Bessemer	11,935,194	9,034,089	32.1
Manganiferous	2,033,387	1,383,451	47.0
Silicious	1,025,498	860,482	19.2
TOTAL	61,972,823	44,373,709	39.6

New York — Little domestic interest has yet developed in tungsten ore. Meanwhile, the price of Chinese wolframite are being sustained principally by continued good European demand at around $24.50 to $25.50, duty paid; domestic schelite is holding on an average at around $3 a ton less, with some scattered sales at substantially under. Domestic sellers are seriously handicapped in selling their products abroad because of the stiff duty involved. Consequently, they have to depend chiefly on such scattered business as is now coming out in this country.

The outlook in foreign ores continues to be clouded. American consumers have fair stocks on hand—some, in fact have heavy stocks and as long as prospects in the steel industry here continues so uncertain there is little likelihood of any early buying activity, particularly with ocean freight rates tending downward at present.

Active European demand for ore continues, with the result that producers of foreign ore are holding their prices at the mines fairly steady. What reductions are being noted here at present are due in most cases to lower ocean rates.

Manganese ore prices are still holding nominally at 45c, not including duty. Active interest on the part of American consumers, it is believed, would result in some shading, but this interest so far has been lacking.

Ferroalloys

Ferroalloy Prices, Page 74

New York—Further price revisions, affecting less than carlot quantities and mostly minor in character are being announced by ferroalloy sellers. The changes for the most part reflect re-estimates in packing and crushing charges rather than any increase in raw materials. Most ferroalloys have been affected, although not all.

Leading sellers of molybdenum alloys are now quoting on the basis of f.o.b. producing plant, instead of freight allowed as heretofore. This represents the first change, it is said, in several years and one leading interest estimates that this will cost the buyer an increase of less than 1 per cent in his purchasing price. Molybdenum alloy sellers have also eliminated the cash discount of one per cent for payment in 30 days; the base prices continue unchanged.

Ferroalloy shipments in general are expected to show some slight gain this month, following the profound lull in December which was the most pronounced for any period in a number of months. This prospect is based primarily on the outlook for somewhat higher ingot production in January.

No change is reported in the general price set-up on either ferromanganese or spiegeleisen. Ferromanganese continues to hold at $102.50, duty paid, Atlantic and Gulf ports and domestic spiegeleisen, 19 to 21 per cent material at $33 Palmerton, Pa., and 26 to 28 per cent material at $39.

Ferrotungsten is nominally unchanged at $2 to $2.25 per pound, tungsten contained, freight allowed in carlots. These prices are based nominally on the current prices for ore and at present are subject to little test in view of the generally light demand which now prevails.

Metallurgical Coke

Coke Prices, Page 73

Pittsburgh — Inactivity continues to spread in the Connellsville beehive coke regions as ovens suspend operations here and there. Shipments, however continue to be made

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under contracts but new business is confined to small lots occasionally. Coke on track sometimes has to wait for weeks before being shipped because of lack of demand. Quotations are unchanged as they appear to have reached rock bottom.

Seattle—For first quarter, British coke is offered at the same price that has prevailed since the middle of 1937, $17, c.i.f., per net ton. Meanwhile production costs and freights have risen but dealers have not increased prices to the consumer. British Columbia coke, selling at $13, Seattle, is being used by some consumers in combination with imported. Dealers have agreed to reduce the margin of profit on British coke, considering conditions unfavorable for higher prices.

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Steel in Europe

Foreign Steel Prices, Page 75

London—(*By Cable*)—Steel markets in Great Britain are quiet, because of the holiday interruption. The slack period has been used for urgent plant repairs following the long period of intense production effort. The stringency in pig iron supplies has been eased, except in the case of foundry iron. Heavier imports of semifinished steel are being received and have relieved the shortage somewhat. Steelworks have orders sufficient to cover their best production for several months. The tube trade is dull and export demand for sheets, including galvanized, is quiet.

The Continent reports export trade is meeting keen competition, with prices weak.

Coke By-Products

Coke By-Product Prices, Page 73

New York—Sulphate of ammonia, spot lots in bulk, is now $29.50 a ton, oven or port, an advance of 50 cents a ton, effective Jan. 1. On a six-month contract basis the price is $28.50, material to be specified for shipment in equal monthly lots. Contracting is more active, the six-month provision expiring Jan. 31. Consumption of distillates is down, but so also is production. Supplies of toluol and xylol, however, are more ample than usual. Benzol demand holds relatively well, substantial orders being taken from the chemical, rubber, motor fuel and plastic industries. Phenol is also moving to the plastic trade in fair volume.

Late Ore Imports Heavy

Philadelphia—Chrome ore imports during the week ended Dec. 25 were the heaviest in weeks at 8695 tons. Of this total, 1265 tons came from Greece, 3960 tons from Turkey, 2500 tons from South Africa and 970 tons from the Philippine Islands. Pig iron imports totaled 1322 tons, all of which came from British India. Norway accounted for 75 tons of ferromanganese. Steel imports were confined to 64 tons of wire rods, 161 tons of steel tubes, 91 tons of steel forgings and 84 tons of steel bars from Sweden.

Men of Industry

(*Concluded from Page* 23)

division plant at Chicopee Falls, Mass.

♦

A. T. Chandonnet, secretary of the manufacturing committee, General Electric Co., Schenectady, N. Y., has been promoted to assistant manager, Elmira Foundry Co. Inc., Elmira, N. Y., an affiliated company. Giles S. Maxwell, present supervisor of costs, will succeed Mr. Chandonnet as secretary of the manufacturing committee. Thomas D. Foy, on special assignments in the manufacturing organization, has been named to succeed Mr. Maxwell as supervisor of costs.

DIED:

■ RICHARD W. JOHNSON, 37, executive secretary, Concrete Reinforcing Steel institute, Chicago, in Evanston, Ill., Jan. 1. He joined the institute in 1927 as engineer, and in 1934 and 1935 served as secretary. In August, 1935, he joined the former Kalman Steel Corp., Bethlehem, Pa., returning to the institute last August as executive secretary.

♦

William B. Clarkson, 75, president, King Ventilating Co., Owatonna, Minn., in that city, recently.

♦

Giles B. Bosworth, for many years associated with the late Henry Clay Frick as treasurer of the Frick Coke Co., Jan. 3, in Denver.

♦

Thomas J. Pryce, 50, sales manager, Wisconsin Screw Co., Racine, Wis., since 1919, in that city, recently.

♦

Thomas H. Doyle, 58, sales director, at the Sharon, Pa., plant of National Malleable & Steel Castings Co., in Sharon, Jan. 4.

♦

Albert E. Mitchell, 82, president since 1933, Wyckoff Pipe & Creosoting Co. Inc., New York, in that city, Dec. 26. He became associated with the Wyckoff company in 1908 as vice president.

♦

Samuel S. Engle, manager, Troy Furnace Corp., Troy, N. Y., and long identified with the pig iron industry, in that city, Jan. 3. He had been associated with Troy operations about 14 years and prior to that was with the Warwick furnaces of the Eastern Steel Co., Pottstown, Pa.

♦

James S. Phifer, 68, for the past 27 years superintendent of American Steel & Wire Co.'s Allentown,

Pa., plant, recently. He became associated with the Consolidated Steel & Wire Co. as master mechanic in November, 1895, and when that company was taken into American Steel & Wire, Mr. Phifer remained, being appointed superintendent in 1910.

♦

Charles A. Olson, 80, retired mechanical engineer, Dec. 30, in Newark, N. J. As a young man he entered the employ of the Westinghouse & Crane Co., manufacturer of valve and air brakes, remaining with this company 34 years. Later he helped organize the Monroe Engineering Co., Newark, of which he was president when he retired about five years ago.

♦

George D. Chamberlain, 69, for many years prominently identified with the practical development of modern open-hearth steel practice, in Irvington-on-Hudson, N. Y., Dec. 28. Born in Christiana, Pa., he entered the employ of the Schoenberger Steel Co., Pittsburgh, later served with the then Carnegie Steel Co.'s Edgar Thomson works. During the World war he was with Heppenstall Forge & Knife Co., after which he became associated with the Ashland, Ky., works of American Rolling Mill Co.

Inland Steel Backs Faith by New Works

■ Inland Steel Co., Chicago, looks to the future with optimism, according to a statement by P. D. Block, president, sent to "friends of the company".

"This faith," he said, "is being evidenced by Inland's construction program, now under way. It will add 30 per cent to the company's pig iron capacity, 20 per cent to its steel capacity and 60 per cent to plant capacity for producing flat-rolled steel products."

G. E.'s 60th Anniversary

■ Observance of General Electric Co.'s sixtieth anniversary began Jan. 3 when Charles E. Wilson, executive vice president, paid tribute to Edison, Steinmetz, Sprague and other electrical pioneers, on a national radio program from Schenectady, N. Y.

Mr. Wilson pointed out Edison Electric Lighting Co. was incorporated Oct. 15, 1887, the first of the companies later merged to form the present General Electric. Complete plans for the anniversary have not been announced.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York — Activity in nonferrous metal markets quickened last week as price sentiment strengthened. Lead advanced 10 points while copper made two advances totaling 37½ points. More favorable news from Washington sources buoyed the stock market which in turn strengthened foreign and finally the domestic metal markets.

Copper — Custom smelters advanced prices ⅛-cent on Wednesday and ¼-cent on Friday to 10.50c, Connecticut, while major primary mine producers held at the 11-cent level. Export copper rose steadily, closing around 10.37½c.

Lead — Higher prices abroad and heavier buying here lifted prices $2 per ton on Friday to 4.85c, New York, and 4.70c, East St. Louis. At the same time St. Joseph Lead Co. announced a curtailment of production at its southeastern Missouri properties of 400 tons per month, or about 33 1/3 per cent. A further price advance this week would not be surprising.

Zinc — Sentiment improved on the stronger tone in other major metal markets but buying generally continued on a carlot basis. Prices held at 5.00c, East St. Louis, for prime western. Stocks increased over 22,000 tons during December.

Tin — Prices fluctuated within a narrow range but the trend was upward with Straits spot closing around 42.00c. Consumer buying interest tapered on the price rise.

Equipment

Chicago — Machinery markets here in some instances are showing better activity than anticipated. Machine tool inquiries are heavier and a moderately good volume of business is in prospect. Closing on number of orders late in December brought total sales for that month for some sellers to the best level since July. Deferred deliveries on a few types of tools are prompting early closing on proposed purchases though in general deliveries are considerably improved. Business in small tools is spotty. Only a few inquiries are appearing from railroads and with the exception of the pending inquiry from the Monon, large lists are lacking. Machine tool builders still have fair backlogs.

New York — Machinery orders are few, rarely for more than one or two tools at a time and mostly for replacements. Little new business is being estimated and considerable volume already figured is held up. Shipments now are being made against the large order placed last year for the Chevrolet plant at Buffalo, N. Y. These were to have started last October, but building construction delay resulted in postponements. Many shops still have fair backlogs of domestic orders for shipment through April, but with deliveries improved, pressure on operating schedules has been partially removed and there have been some layoffs. Overtime and extra shifts have been largely eliminated. Prices are holding firm on all metal-working machines.

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Construction and Enterprise

Michigan

BAY CITY, MICH.—Federal communications commission has issued permit for constructing 300-watt police radio transmitter for Bay City to replace present 50-watt station. Terms of permit say work must start by Feb. 7.

DETROIT—L. J. Schrenk, superintendent, Detroit public lighting department, announces WPA project in 1938 for furnishing proposed sewage disposal plant with electric power from Mistersky station. Cost $456,000.

DETROIT—Detroit department of public works announces bids are due Jan. 18 for sludge filter and incinerator building to be erected at Detroit sewage disposal plant.

DETROIT—Detroit department of public works is taking bids to Jan. 18 for the construction of a sludge filter and incinerator building along with related works for Detroit sewage treatment plant.

GRAND RAPIDS, MICH. — Consulting engineers disclosed recently Grand Rapids will have to spend money for secondary sewage treatment. Estimated cost $1,000,000.

LANSING, MICH.—Consumers Power Co. has been authorized by the state public utilities commission to issue $12,000,000 worth of bonds, $9,000,000 immediately to finance construction and expansion program. The company asked permission to issue bonds as part of a $17,943,050 program to improve and expand its properties. Improvements include 70,000-kilowatt and 35,000-kilowatt plants at the mouth of Saginaw river on Saginaw bay and Kalamazoo respectively.

Pennsylvania

BUTLER, PA.—General state authority, 600 North second street, Harrisburg, Pa., Col. Augustine S. Janeway, executive director, takes bids shortly for power plant and equipment estimated at $160,000, and sewage disposal plant estimated at $35,000, both listed as separate items in new tuberculosis sanitarium project.

HARRISBURG, PA.—The general state authority, Col. Augustine S. Janeway, executive director, 600 North Second street, Harrisburg, plans buildings and improvements at Pennsylvania State college, Centre County, Pa., including plant equipment and service lines, consisting of 2500-kilowatt turbine generator, three-pass water condenser, new water-cooling tower, and repairs to existing service lines. Cost $260,000. Hunter & Caldwell, Altoona, Pa. and Charles Z. Klauder, Philadelphia, associated architects.

PHILADELPHIA — Ordnance department, Frankford arsenal, takes bids to Jan. 12, invitation 314-38-574, for multiple-spindle, high-speed, semi-automatic drilling machine, delivery Frankford arsenal.

PHILADELPHIA — Ordnance department, Frankford arsenal, takes bids to Jan. 11, invitation 314-38-570, for 1120 feet cold finished steel bar, invitation 314-38-569 for 12,240 feet cold rolled stainless steel rod, delivery Frankford arsenal, Philadelphia.

New York

NEW YORK—Industrial Foundry Inc. has been incorporated here in Manhattan to make castings. 200 shares no par value stock.

New Jersey

TRENTON, N. J. — Tifaloy Inc. has been incorporated here to manufacture machinery. 2500 shares no par value stock. Samuel M. Goodman, agent.

Indiana

INDIANAPOLIS—Wallace Tool & Die Co., now at 470 Massachusetts avenue, has leased one-story building at 912 to 916 Pierson street and moved into new location Jan. 1.

INDIANAPOLIS — Fletcher Sales Co., 835 Security Trust building, would like to purchase 125 to 200-kilovolt-ampere 3-phase, 60-cycle 2300-volt water turbine and vertical generator to operate under 9-foot head.

INDIANAPOLIS — Metal Industries Inc., 908 North Senate avenue, Indianapolis, has filed articles of incorporation with the Indiana secretary of state, and will manufacture sheet metal jugs and insulated containers, 1000 shares no par value capital stock. J. H. Albershardt, R. D. Robinson, G. Pearson Smith, incorporators.

Illinois

CHICAGO—Red Top Steel Post Co., 38 South Dearborn street, has been incorporated here with 100 shares par value stock to manufacture iron, steel, copper, manganese and metals. W. D. Truesdale, H. H. Straus, J. H. Morris, incorporators. Richard Grossman, Mayer, Meyer, Austrian & Platt, Continental Illinois Bank building, correspondent.

Ohio

WRIGHT FIELD, DAYTON, O.—Air corps, material division, receives bids to Jan. 14, invitation 38-562, for four hydraulic pumps, delivery, one to Fairfield air depot, Osborn, O., three to San Antonio air depot, Duncan field, Tex.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, receives bids to 10 a. m., Jan. 18, schedule 2358, for ventilation equipment including spare parts, delivery Brooklyn, N. Y.

WASHINGTON — General purchasing officer, Panama canal, receives bids to 10:30 a. m., Jan. 13, for various amounts of sheet iron or steel, sheet copper, zinc plates and sheets, steel wire, steel bolts, nuts and rivets, cast-iron pipe, pipe fittings, pipe unions, bibb cocks, curb cocks, ball cocks, cone-type through-flow valve, gate, globe and relief metal valves, delivery, Cristobal or Balboa, Panama, Canal Zone.

WASHINGTON — General purchasing officer, Panama canal, takes bids to 10:30 a. m., Jan. 20, schedule 3316, for main pumping machinery and auxiliary equipment for installation in new relay barge, including motors, regulators, and switchboard, delivery Cristobal or Balboa, Canal zone; until 10:30 a. m., Jan. 21, schedule 3318, for insulated wire, stove wire, cast-iron fittings, and metal roofing, delivery Cristobal or Balboa, Canal zone.

Tennessee

CHATTANOOGA, TENN.—Chattanooga electric power board, S. R. G. Finley, chief engineer, submitted to PWA for preliminary study plans for first contract to be let, including constructing 44-kilovolt transmission lines from Chickamauga dam to substation No. 1, substation No. 2, substation No. 3 to substation No. 6 and return to Chickamauga dam. Bids called for in February. Cost $100,000. Col. Harold C. Fiske, power board chairman.

LEWISBURGH, TENN.—City, care of J. N. McCord, mayor, plans constructing electric distribution system. Cost $100,000. PWA loan $55,000 and grant $45,000 approved. Freeland Roberts Co., Industrial building, Nashville, engineer.

MEMPHIS, TENN.—U. S. engineer, box 97, takes bids to Jan. 12, invitation 1092-38-170F, for rough steel castings.

PARIS, TENN.—City, care of Y. Q. Caldwell, mayor, plans electric distribution system. Cost $325,455. PWA grant and $135,000 approved. Reese, Hart & Russell, Hitchcock building, Nashville, engineers.

SHELBYVILLE, TENN. — REA made an additional allotment of $36,400 to Duck River Electric Membership Corp.

Kentucky

HICKMAN, KY.—Board of directors, Fulton County Rural Electric Co-operative, Robert T. Hosmon, Princeton, Ky., project supervisor, plans constructing distribution line. Applied for $100,000 REA funds.

LOUISVILLE, KY.—Louisville Gas & Electric Co. has authorized new outdoor power substation for feeder service in vicinity of Taylorsville road where company has 25 acre tract, one-fifth of which will be used for new station. Cost with transformers, equipment and switchgear $100,000.

West Virginia

CABIN CREEK JUNCTION, W. VA.—Pure Oil Co., 35 East Wacker drive, Chicago, plans installing motors and controls, conveyors, electric pumping machinery and other equipment in connection with improvements and expansion in oil refinery plant here. Cost $1,000,000.

ELKINS, W. VA.—Kenwood Corp., a co-operative organization, will open bids about Feb. 1 for construction of lumber plant at Tygart Valley homestead, 11 miles from Elkins, including buildings and equipment. Plans and specifications now being prepared by E. T. Hutchings, Louisville, Ky. $400,000 loan has been approved by U. S. secretary of agriculture. Cost of buildings and equipment $250,000. The Kenwood Corp. in collaboration with Gamble Bros., 4600 Louisville avenue, Louisville, Ky.

Missouri

ST. LOUIS—Falstaff Brewing Corp., Joseph Griesedieck, president, 3684 Forest Park boulevard, beer manufacturer and distributor, is completing plant expansion to double present capacity, including new machinery and brew house. Cost of project $300,000.

ST. LOUIS—National Lead Co., titanium division, C. Y. Pfoutz, superintendent, Carondelet station, plans building program and plant expansion to be completed May 1, 1938. Includes new buildings, installing machinery and extensions.

Oklahoma

HOLDENVILLE, OKLA. — City voted $70,000 bonds for waterworks improvements and extensions.

Wisconsin

ELK MOUND, WIS. — Dunn County Electric Co-operative, M. B. Rotnem, secretary, has received REA allotment of $105,000 from total $620,000 requested for rural electrification project involving 573 miles transmission lines in Dunn, Chippewa, Eau Claire, Pepin, and Pierce counties. Power will be furnished by REA-financed generating plant at Chippewa Falls.

TOMAHAWK, WIS.—Wisconsin Public Service Corp., J. P. Pulliam, president, plans improvement program in 1938 including new 17,500-kilowatt capacity hydroelectric plant on the Wisconsin river

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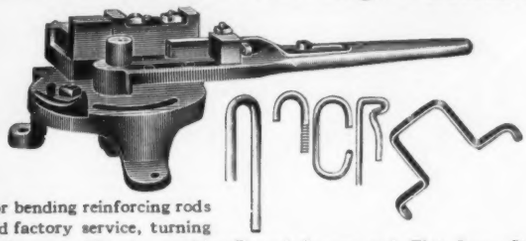

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near Tomahawk, 32-mile 66,000-volt transmission line from new plant to city of Wausau, and necessary substations. Cost of program $1,675,000.

Minnesota

BEMIDJI, MINN.—Bemidji Wood Products Co. plans rebuilding sawmill recently damaged by fire.

DE GRAFF, MINN.—Bond issue has been approved by voters to aid financing construction of sewage plant including well pump, pump house, and 30,000-gallon storage tank. WPA project. J. McCarthy, village clerk. E. G. Briggs, 1957 University avenue, St. Paul, Minn., consulting engineer.

DULUTH, MINN. — Western Welder Corp. has been incorporated here with $50,000 capital stock to conduct welding business. H. B. Fryberger Jr., H. C. Fulton, T. G. Vaillant, incorporators.

MINNEAPOLIS — Safway Steel Scaffolds Co. has been incorporated here with $20,000 capital stock. F. H. Graser, H. M. Blume, and Albin Halquist, incorporators.

MINNEAPOLIS — Funk Mfg. Co. has been incorporated here with $50,000 capital stock to manufacture household appliances. Incorporators, C. W. Funk, B. M. Bros, and Paul S. Redding.

NORTH MANKATO, MINN.—City, M. R. Wigley, city clerk, is taking bids to 8 p. m., Jan. 17, for a 2000-gallon-per-minute single-phase sewage pump unit to work against 21-foot head.

OWATONNA, MINN.—City, Roy Phelps, city engineer, is preparing preliminary plans for constructing sewage disposal plant. Cost $250,000. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

Texas

ATLANTA, TEX.—City, E. C. McKinney, secretary, completing plans and will probably receive bids in January for extensions and improvements to waterworks, including new 125,000-gallon elevated tank, complete new sewer system and disposal plant. Cost $90,000, available in bonds already voted. F. J. Von Zuben, Electric building, Ft. Worth, engineer.

COLORADO, TEX.—H. M. Champion, Anderson-Prichard Oil Corp., Ramsey Tower, Oklahoma City, Okla., and associated companies plans constructing gasoline pipe line from Colorado, Tex. to Des Moines, Iowa. Line approximately 1350 miles long, 6, 8, and 10-inch pipe parallel to existing pipe line. Cost $12,000,000.

CORSICANA, TEX. — Navarro Rural Power Co., E. P. Estes, completing plans or 120-mile power lines in Navarro and Hill counties. Cost $513,000. Hawley, Freese & Nichols, Capps building, Ft. Worth, engineers.

KAUFMAN, TEX.—Rural Electric Co. W. W. Biard, secretary, will have plans complete about Jan. 15 for 250 miles rural power lines. Allotment of $100,000 available. Hawley, Freese & Nichols, Capps building, Ft. Worth, engineers. (Noted Dec. 20, 1937)

LUBBOCK, TEX.—South Plains Electric Co-operative Inc. receives bids Jan. 15 for constructing 110 miles of power line. Hawley, Freese & Nichols, Capps building, Ft. Worth, Tex., engineers.

SAN ANTONIO, TEX.—San Antonio Public Service Co. will spend $1,000,000 for improvements, principally in its gas and electric division during 1938. D. A. Powell, executive vice-president.

North Dakota

BISMARCK, N. DAK.—State planning board, Governor Langer, chairman, has submitted to bureau of reclamation, Denver, a program to provide communities with better water supply and sewage dilution. Estimated cost $5,362,000. E. J. Thomas, chief engineer.

South Dakota

FLANDREAU, S. DAK. — City, Carl Hanson, city auditor, will vote Jan. 18 on $158,000 bond issue to finanace purchasing generating and distribution system of the Union Public Service Co., and will add two diesel engines and 375-horsepower generators.

MITCHELL, S. DAK.—City, T. Eastcott, city auditor, is considering purchasing a diesel engine for municipal sewage disposal plant.

SIOUX FALLS, S. DAK.—Dakota Culvert & Pipe Co. has been incorporated here with capital stock of $100,000 to manufacture corrugated metal culverts and pipe. E. A. Roberts, H. S. Claybaugh, and C. A. McTaggart, incorporators.

Iowa

BEDFORD, IOWA—City, H. E. Nelson, city clerk, takes bids soon for constructing a sewage disposal plant. Cost $30,000. Young & Stanley Inc., Muscatine, Iowa, consulting engineers.

MASON CITY, IOWA—Rolfe Products Co. has been incorporated here to manufacture gates, fence and farm equipment, sheet, plate and structural iron work, and various iron and steel products.

OSAGE, IOWA—Hugh Nichols, owner Nichols Planing Mill, plans rebuilding mill damaged by fire Nov. 29.

Nebraska

COLUMBUS, NEBR.—Loup River Public Power District, Harold Kramer, 2307 Thirteenth street, Columbus, takes bids to Jan. 12 for 867 meters in six sizes for metering current. Harza Engineering Co., 205 West Wacker drive, Chicago, consulting engineer.

COLUMBUS, NEBR.—Loup River Public Power District, Harold Kramer, 2307 Thirteenth street, Columbus, has filed plans for approval with REA for extending its rural transmission lines into Colfax county. Harza Engineering Co., 205 West Wacker drive, Chicago, consulting engineer.

COLUMBUS, NEBR.—Nebraska state railway commission has granted permission to Loup River Public Power District to construct 70-mile 115,000-volt power line from Columbus to Lincoln. Estimated cost $339,000. Harold Kramer, 2307 Thirteenth street, Columbus, district secretary. Harza Engineering Co., 205 West Wacker drive, Chicago, Ill., consulting engineer. (Noted Dec. 6 issue)

OMAHA, NEBR.—George C. Adwers, superintendent of buildings, has been authorized by the board of education, sixth floor, city hall, Omaha, to prepare plans and specifications, and estimate cost of installing generating unit at technical high school to furnish light and power. Dr. H. E. King, chairman of the board. Cost $25,000.

ORD, NEBR.—City council has authorized purchase of additional diesel engine for municipal power plant. Lucinda Thorne, city clerk. George Allen, city engineer.

ORD, NEBR.—Nebraska state railway commission held hearing Jan. 4 on application of North Loup River Public Power & Irrigation District for permission to construct 40-mile 34.5-kilovolt power line between Olean and Burwell. Joseph P. Barta, district secretary. Black & Veatch, 4706 Broadway, Kanasas City, Mo., consulting engineers.

STROMSBURG, NEBR.—Polk County Rural Public Power District, Agvall S. Torrell, secretary, has filed application with state railway commission for permission to construct 33 miles of rural transmission lines. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

WILBER, NEBR.—Norris Rural Public Power District, R. N. McCord, president, takes bids to 10 a. m., Jan. 14, for 300 meters and meter sockets. Davis & Schwob, Crete, Nebr., consulting engineers.

Montana

HELENA, MONT.—WPA has approved following proposed water system improvements: Great Falls, $36,848; Columbia Falls, $12,116; Livingston, $34,948.

Idaho

PRESTON, IDAHO—Plans for municipal water system approved by PWA, and bids will be received soon. R. G. Harding, Salt Lake City, consulting engineer.

Pacific Coast

LOS ANGELES—Vultee Aircraft Co., 837 Cerritos avenue, Downey, Los Angeles suburb, is erecting factory and alternate building.

LOS ANGELES—A certificate to conduct business under the name Architectural Iron works at 1667 East Twenty-third street, Los Angeles, has been issued to the owners.

LOS ANGELES—A certificate to conduct business under the name of El Paseo Pipe & Machinery Co., 1412 South San Pedro street, has been issued.

LOS ANGELES — Lockheed Aircraft Corp., Burbank airport, will erect additions to its plant immediately, including enlargement of hydro-press building in the sheet metal department. Cost $41,500.

LOS ANGELES—Marvin Metals Inc. has been incorporated here with 1000 shares capital stock. A. M. and H. M. McLellin, W. C. Billsborough, D. S. Welts, Wilma Russ, all of Los Angeles, directors. David Welts, attorney, 1052 North Cahuenga boulevard, corporation representative.

SANTA MONICA, CALIF.—The Southern California Edison Co. will build a power substation on Marine street, Ocean Park, Santa Monica. Cost $103,000. Charles E. Hewes, district manager.

HEPPNER, OREG.—Site has been purchased by H. O. and N. E. Wray, Yakima, Wash. for constructing sawmill with 50,000 feet daily capacity.

HOOD RIVER, OREG.—Fire damaged the four-story packing plant of Hood River Apple Growers association.

PORTLAND, OREG.—Pleasant Home Water District calls for bids soon for system improvement including 45,500 feet 2 to 6-inch pipe, reservoir, pumps, meters. Cost $29,000. Carl R. Goger, 628 Spalding building, secretary.

ANACORTES, WASH. — Plans announced removal from Everett of Fishermen's Packing Corp. plant. Addition will be built including machinery installation. Cost $40,000.

SEATTLE—Schmidt Brewing Co. Inc. with a capital of $550,000 has been organized by Leopold F. Schmidt and associates. Modern plant with annual capacity of 75,000 barrels will be constructed.

SPOKANE—Interstate Telephone Co. has budgeted $365,000 for 1938 for extending lines and new equipment in the Wenatchee, Wash. area.